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Number 6.

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TEXTILE WORLD RECORD

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LORD & NAGLE COMPANY · Boston & Philadelphia

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The Annual Official Directory of the Textile Industries for 1904 is now ready for prompt delivery.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, drawings and full particulars of complete plants furnished on application

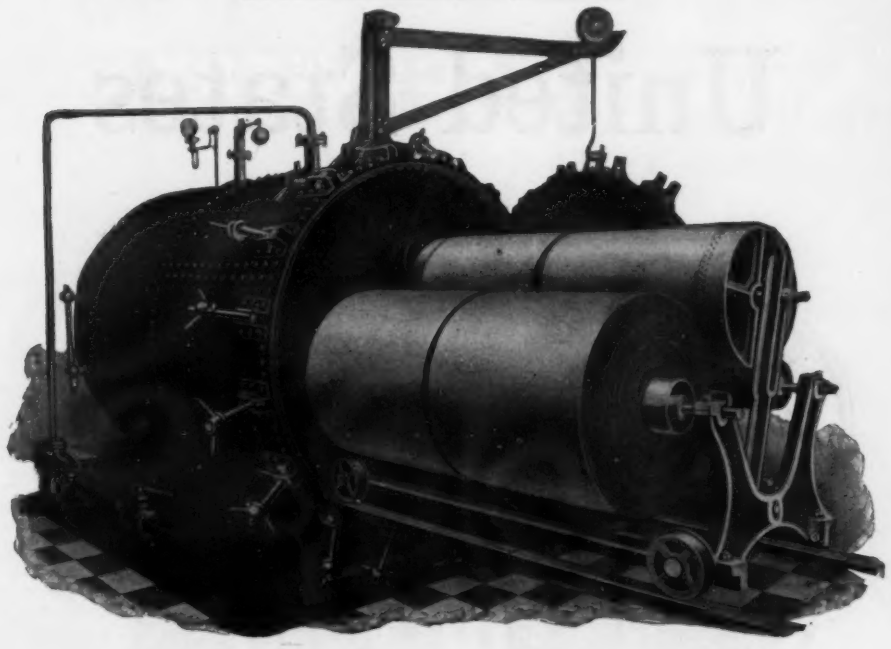
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

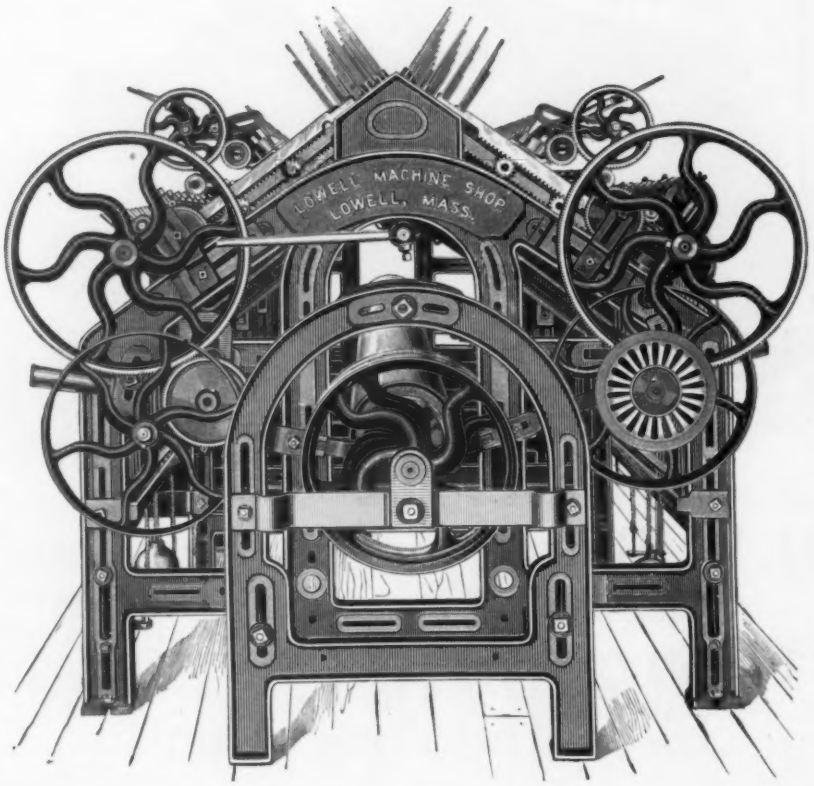
PHILADELPHIA

Sole Makers for the United States

Worsted Machinery

MADE IN THE

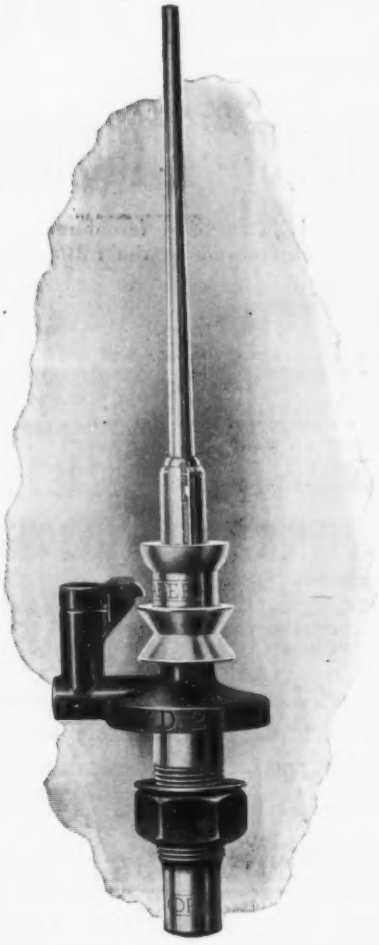
United States



Lowell Machine Shop

LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

Draper Company, Hopedale, Mass.

We Also Build Looms.

We beg to inform the trade that our

Automatic Shuttle and Loom Attachment

Can be seen in operation on Cotton, Silk and Worsted Looms of different makes. An inspection of these looms will convince every manufacturer of the following

GREAT ADVANTAGES:

1. Our device can be put on any modern Cotton, Silk or Worsted Loom.
2. Our shuttles change on the pick while the loom is running at regular speed and absolutely *leave no broken picks.*
3. It *does not affect the speed* of the loom at any time.
4. Our attachment is so *very simple* that it needs no more care than an ordinary loom and there is *no intricate mechanism* in our attachment which is liable to come out of order.
5. A weaver can attend, without extra exertion, to a *greater number of looms* with our device than with an ordinary loom.
6. It thus enables the weaver to earn *more wages.*
7. It is *time saving* and gives an *increase in the production* which is very considerable.
8. It reduces the manufacturing expenses *to a large extent.*
9. *Waste* on the quills is *reduced* to almost nothing.
10. As the loom stops less frequently, its operation is more regular, consequently producing *better* goods and also keeping the *looms in better condition.*

The superiority of our Automatic Shuttle and Loom Attachment over all existing similar devices is its simplicity and the fact that it absolutely leaves no mispicks whatsoever, which has been a cause of surprise and admiration to all experts who have seen our Attachment in operation.

We Guarantee Our Automatic Shuttle and Loom Attachment to Do Exactly What We Mention Above.

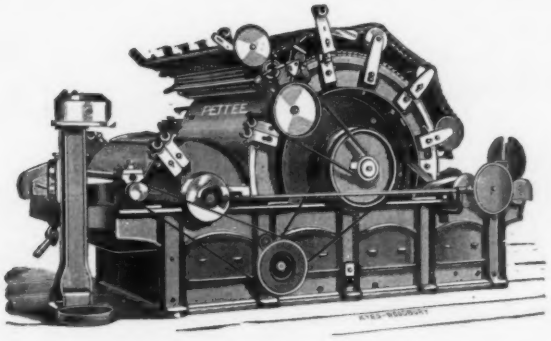
For Inspection, please communicate with our office,
415 BROADWAY, NEW YORK.
Works, Slatington, Pa.

THE ASALA COMPANY.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
Newton Upper Falls, Mass.

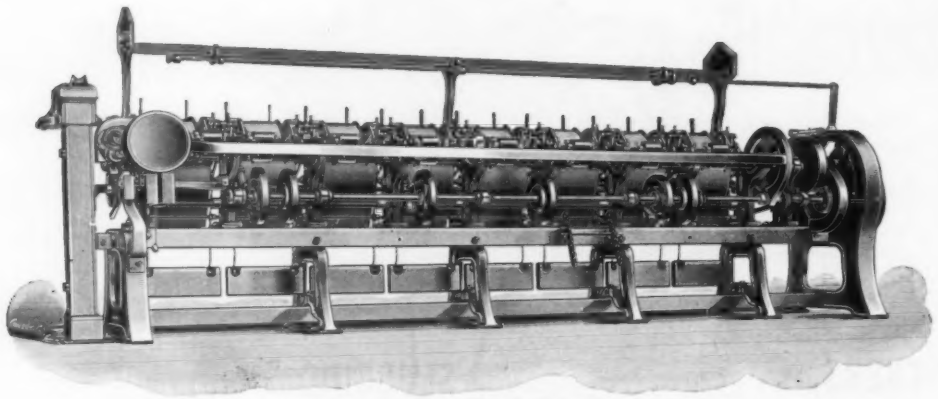
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

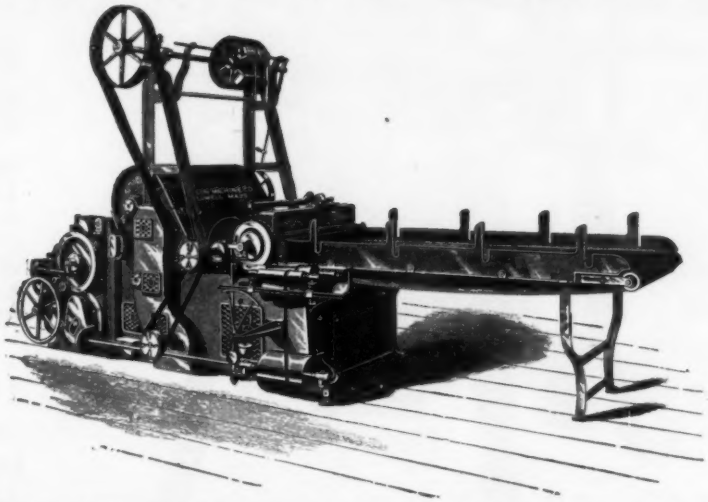
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

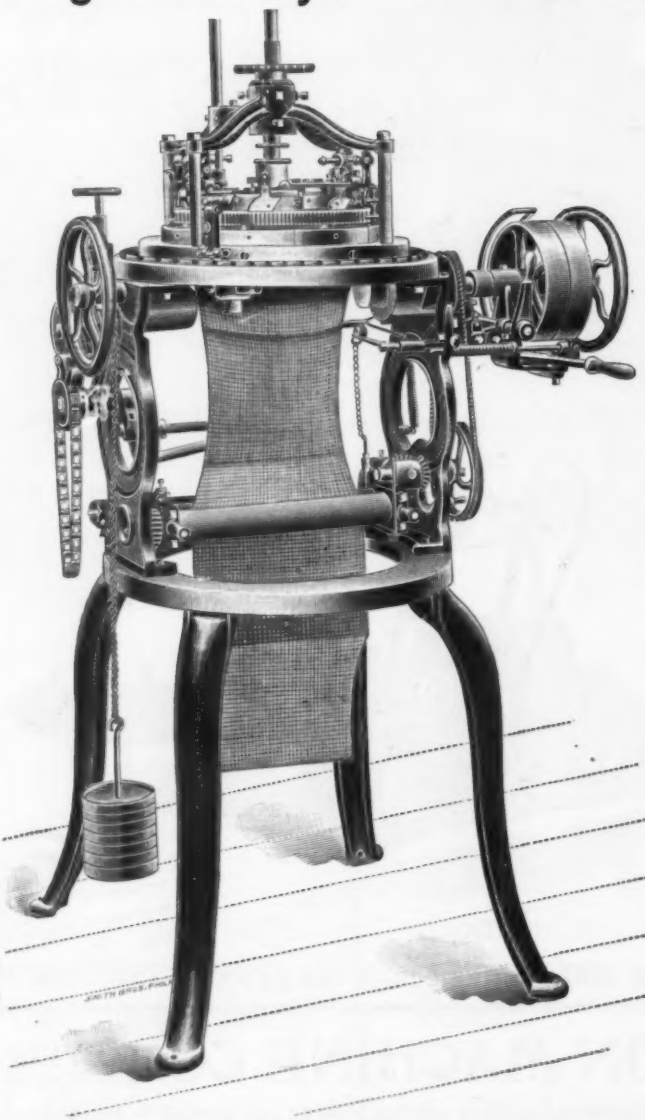
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes. 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BRANSON MACHINE CO.

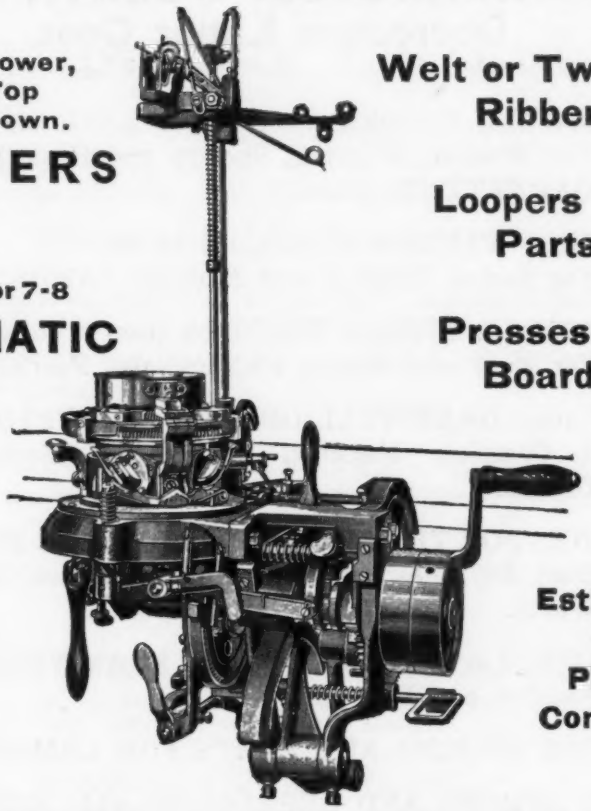
BUILDERS OF

KNITTING MACHINERY

Hand or Power, Open Top or Hold Down.
KNITTERS

1-2, 3-4 or 7-8
AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



Welt or Two-Feed Ribbers.

Loopers and Parts.

Presses and Boards.

Estimates for Plants Complete.

Winders and Bobbins. Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

504 North American Street, : : Philadelphia, Pa.

Write for Information and Catalogue.

HARWOOD'S MACHINERY

Increases Production,
Improves Quality,
Decreases Labor Cost.

THE BRAMWELL FEEDER (over 12,000 now in use.)
For Woolen, Worsted, Shoddy and Hosiery CARDS and GARNETT Machines.

THE APPERLY FEEDER (over 15,000 in use.)
For Second Breaker and Finisher CARDS.

THE BRAMWELL PICKER FEEDERS (two styles.)
For Burr and Mixing Pickers, also Fearnaughts.

THE NEW 1902 BRAMWELL OPENER AND FEEDER,
A Complete Machine. For Wool Washers and Wool Dryers.

SOLE AGENTS FOR THE SPENCER AUTOMATIC STOCK OILER,
Send for Sheet of Testimonials. Saves Oil, Labor and Waste.

A NEW CLUTCH ATTACHMENT FOR BRAMWELL FEEDERS,
Positive and Durable.

A FULL LINE OF PINS AND PARTS FOR LAMAIRE FEEDS.

IMPROVED APRONS AND REPAIRS OF ALL KINDS.

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53 State Street, Room 703,
BOSTON, MASS.

Long Distance Telephone, 3212 (Main) Boston.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt Bros. & Co. are exhibiting in the Varied Industries Building, Louisiana Purchase Exhibition, St. Louis, Mo., the most complete line of Cotton Machinery that has yet been exhibited, for spinning from coarse counts up to 300's.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

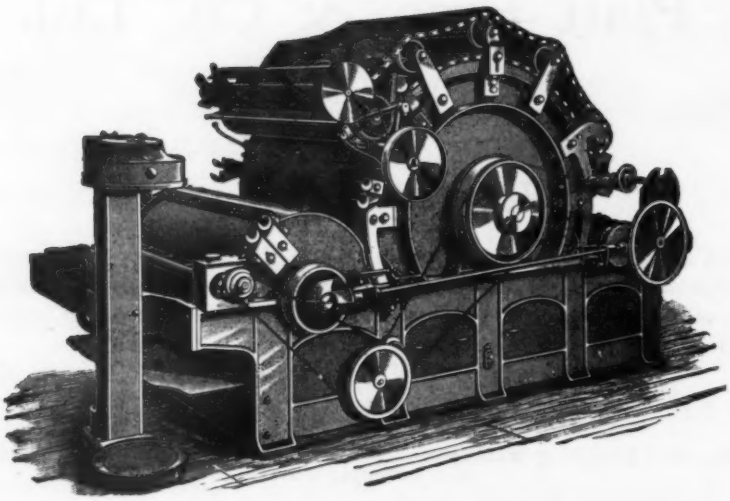
JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

MASON MACHINE WORKS,

TAUNTON, MASS.

Cotton Machinery



Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING

Plain and Fancy Silk Looms

Southern Office, Charlotte, S. C.

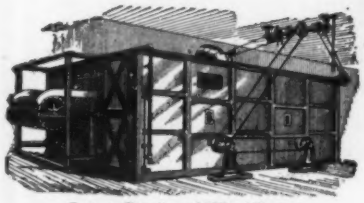
"HURRICANE" DRYERS AND FANS

For WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR,
Etc.

Truck Yarn Dryer.

Write for Booklets.

"Hurricane" Fan, Style No. 2.



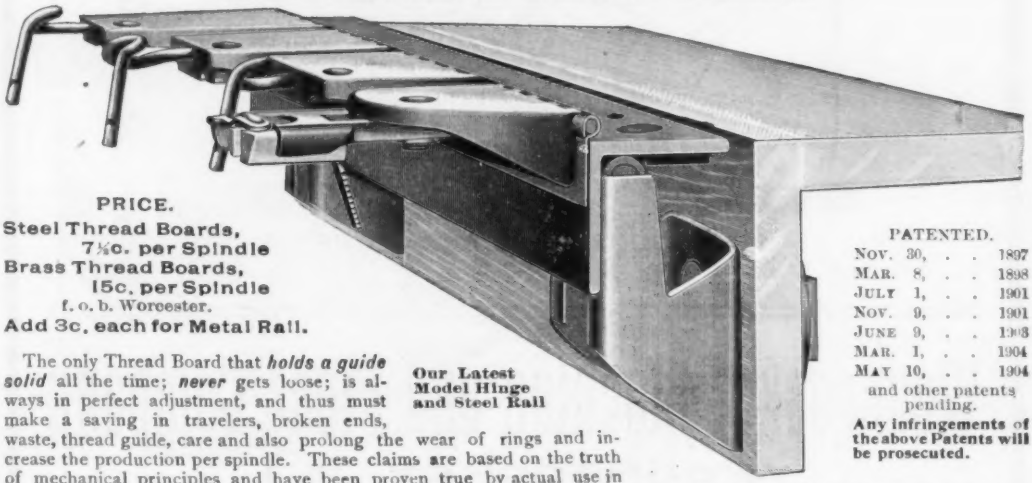
Cotton Stock and Wool Dryer.

CARBONIZING,
BLEACHING,
OXIDIZING, CHROMING and WASHING MACHINERY.

PHILADELPHIA DRYING MACHINERY CO.
6721 Germantown Ave., Philadelphia, Pa.

HOUGHTON'S ALL STEEL THREAD BOARD

With Hardened Thread Guides.



Our Latest Model Hinge and Steel Rail

PRICE.
Steel Thread Boards,
7½c. per Spindle
Brass Thread Boards,
15c. per Spindle
f. o. b. Worcester.
Add 3c. each for Metal Rail.

PATENTED.

Nov.	30, . .	1897
Mar.	8, . .	1898
July	1, . .	1901
Nov.	9, . .	1901
June	9, . .	1903
Mar.	1, . .	1904
May	10, . .	1904

and other patents pending.

Any infringements of the above Patents will be prosecuted.

The only Thread Board that ***holds a guide solid*** all the time; ***never*** gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles and have been proven true by actual use in many mills, whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

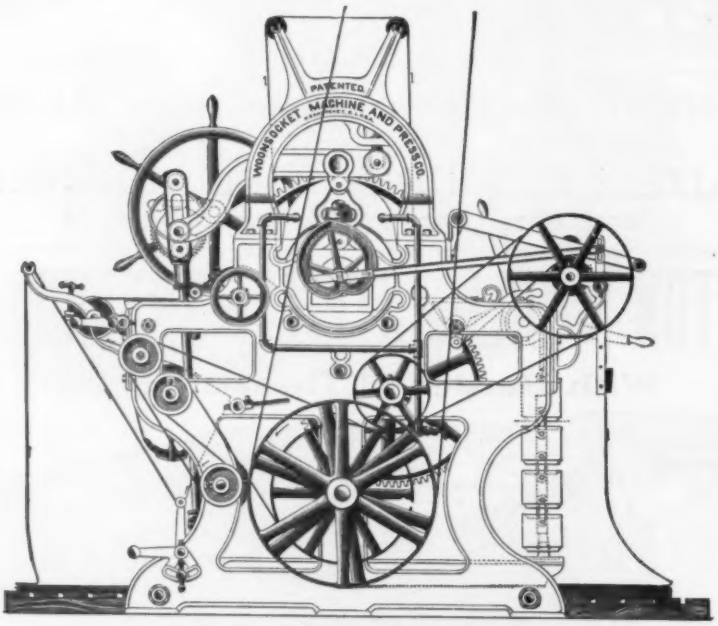
L. T. Houghton, Sole Manufacturer, Worcester, Mass.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

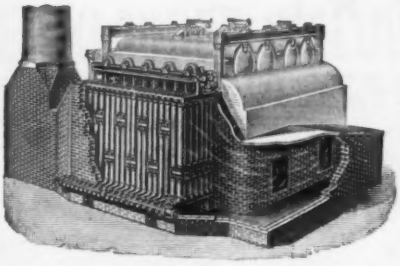
Woonsocket Machine and Press Company

WOONSOCKET, R. I,

THOUGHTFUL CONSIDERATION

on the part of the Engineer, makes great economies in the running of a Plant, particularly if assisted by a

Green's Economizer

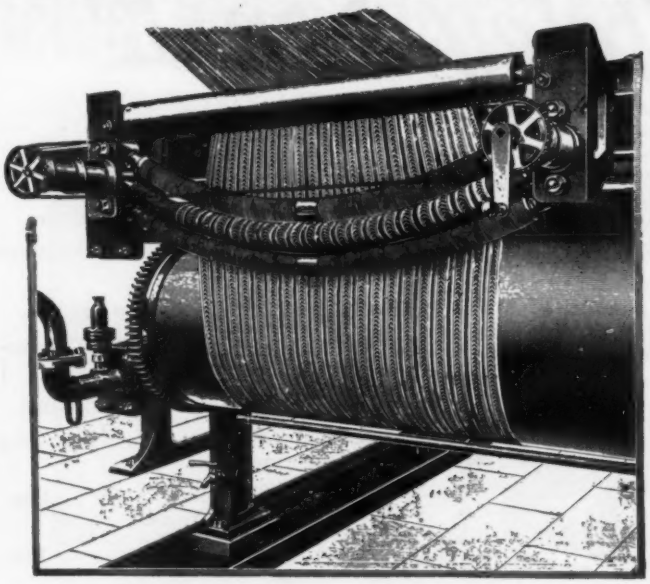


which is the greatest assistant to true economy yet produced. The gain in steam, with the corresponding reduction of fuel, seems incredible, but with our Economizer you can easily save from 10 to 20% in Fuel, and yet, through the use of waste gasses entirely, keep the feed-water heated above the boiling point. What this means to the **Textile Mill, Bleacheries** and **Dyehouses,** is best ascertained through the testimonials of those having one in their boiler room. Our booklet, sent free, shows not only how it is done, but gives you a list of users, and their testimonies as to the value to them. Our great advantage—applied without stoppage to works Write us for plans and specifications.

THE GREEN FUEL ECONOMIZER CO.,

Sole Manufacturers in the U. S. A. **Matteawan, N. Y.**

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

Sole Agents for the United States and Canada.

THE

A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

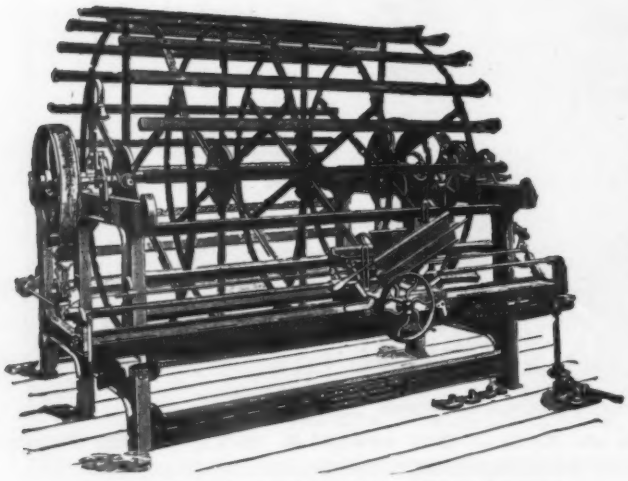
The Leading Manufacturers of

PREPARATORY COTTON MACHINERY

Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm Whiteley & Sons Ltd.

LOCKWOOD, HUDDERSFIELD.



WARPING MILL WITH PATENT SECTION DIVIDER.

Makers of all descriptions of

Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines.

Hydro Extractors. Warp Sizing.

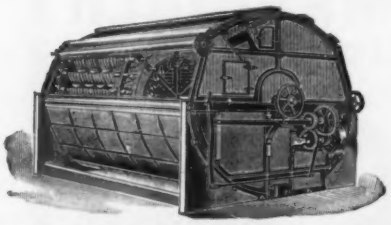
Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

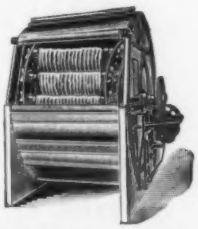
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



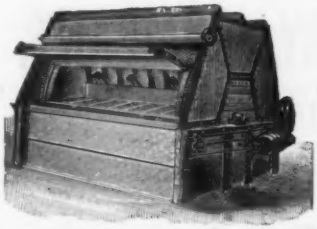
THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

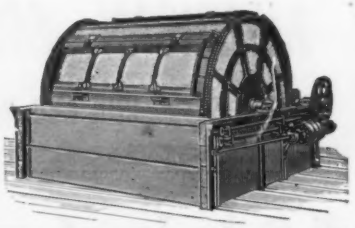
RAW WOOL AND COTTON MACHINES.



CAPACITY
200 to 1000 lbs per batch.

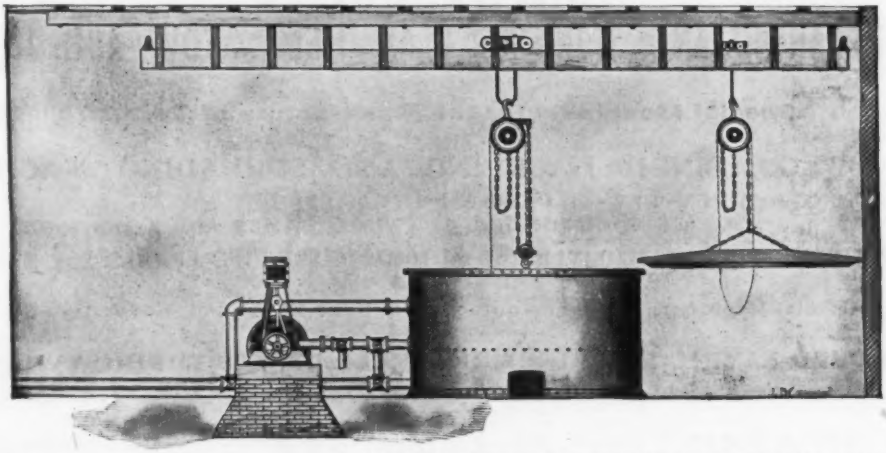
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

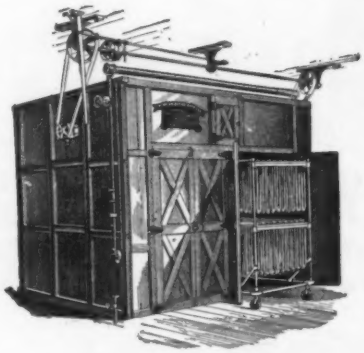
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Repiying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

DRYERS
for
WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR.
VENTILATING FANS.
MACHINERY
for
CARBONIZING
and
YARN SCOURING.



TRUCK YARN DRYER.

CLOTH WASHERS
and
CLOTH DYEING MACHINES, BLEACHING MACHINERY FOR KNIT GOODS, ETC.
CONTINUOUS SYSTEM FOR BLEACHING COTTON STOCK.
TOM-TOMS,
CHROMING, WASHING
and
OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

19th AND WESTMORLAND STS., PHILADELPHIA, PA.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. **LEEDS.** **England.**

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

Let us put it before you plainly

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and their verdict is that it

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Double Carding Process for Wool

(Patented May 10, 1904)

Is a Great Success.

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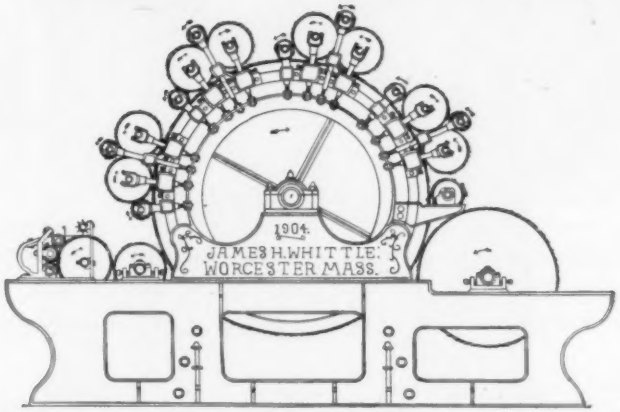

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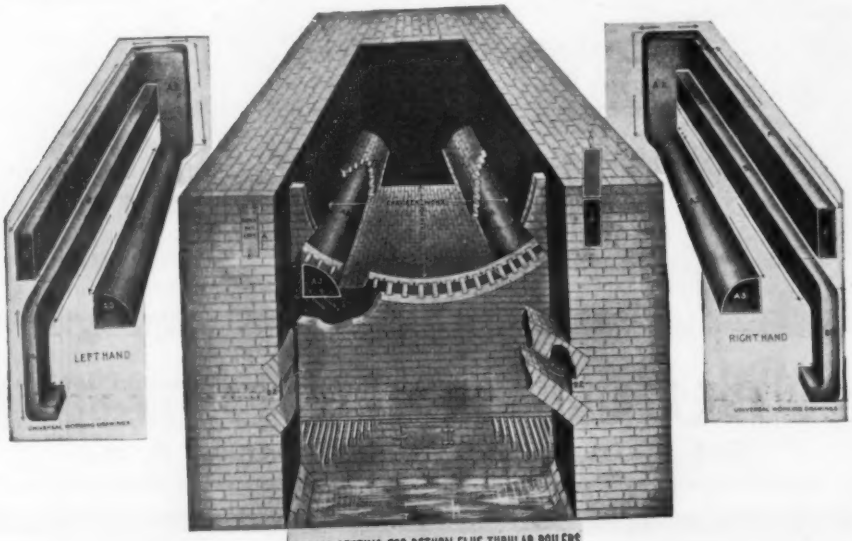
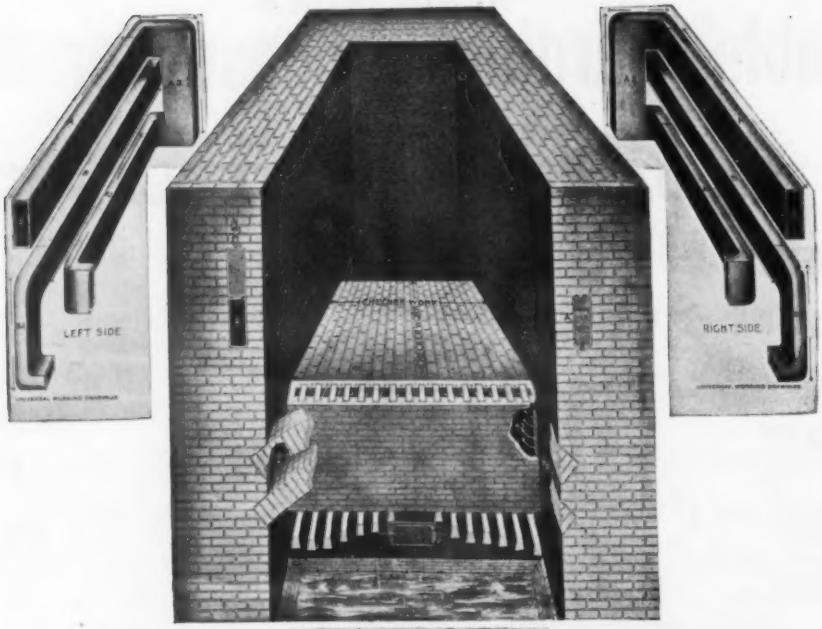


TYPICAL SETTING FOR RETURN FLUE TUBULAR BOILERS



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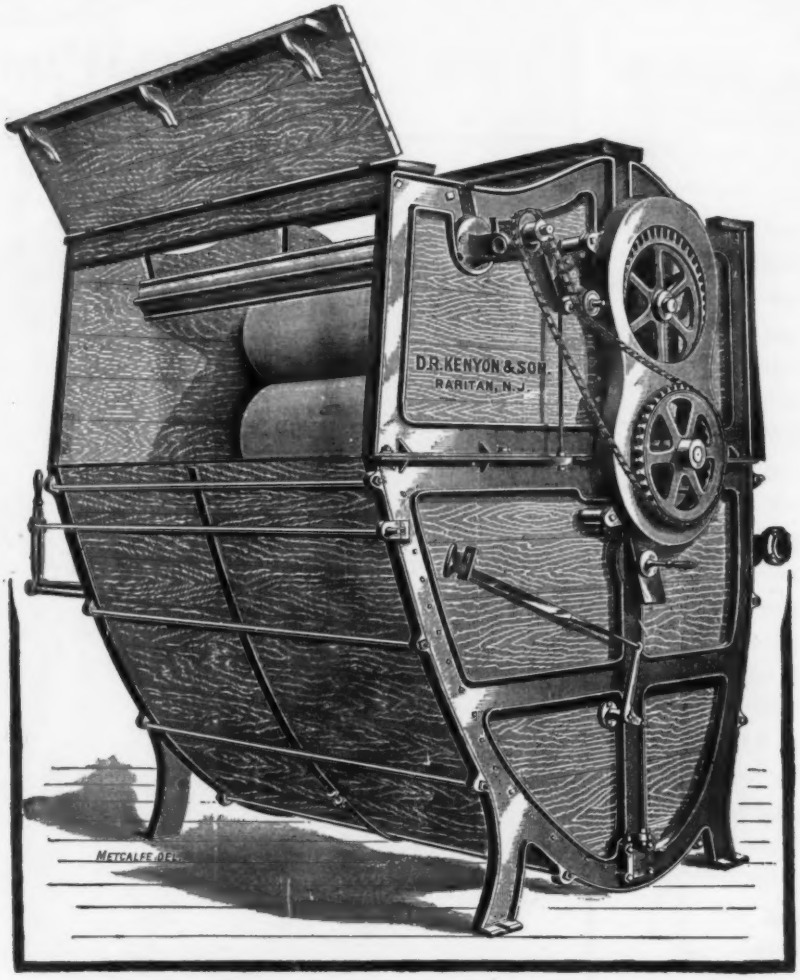
FOR FOUR, SIX OR EIGHT STRINGS OF GOODS



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Improved trough and valves, preventing wash of liquor and insuring quick and thorough scouring and rinsing.

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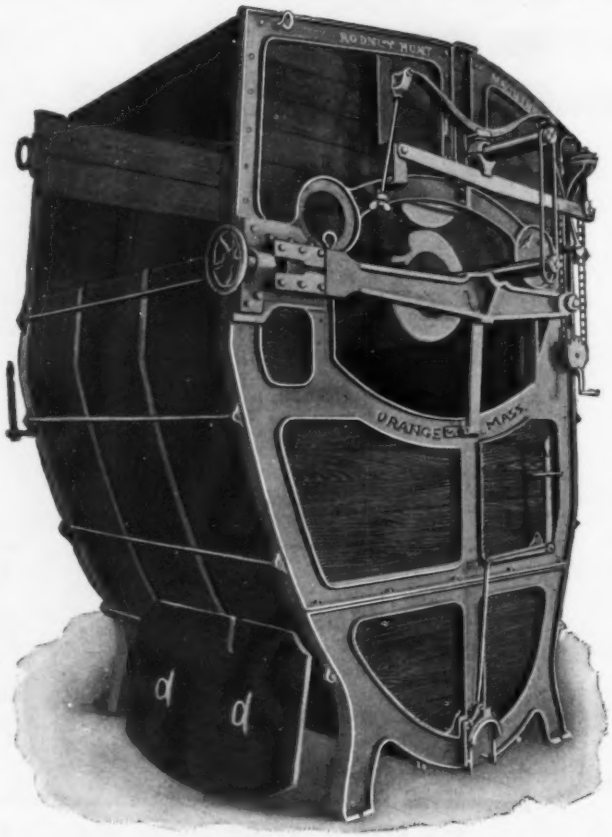

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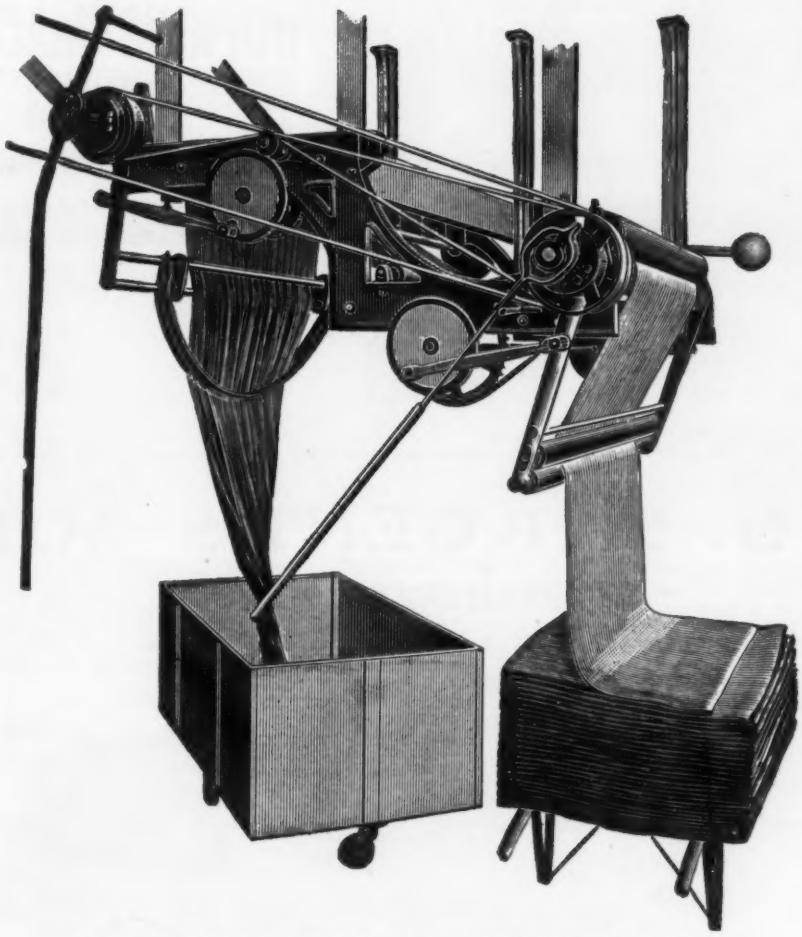

ONE MAN CAN OPEN AND FOLD MORE GOODS IN A DAY WITH THIS MACHINE THAN FOUR MEN CAN DO BY HAND.

No stretching or beating of goods under tension. All the parts coming in contact with cloth are brass or wood.

Opens any width of cloth from 63 inches down to 30 inches. Can be built wider for blankets.

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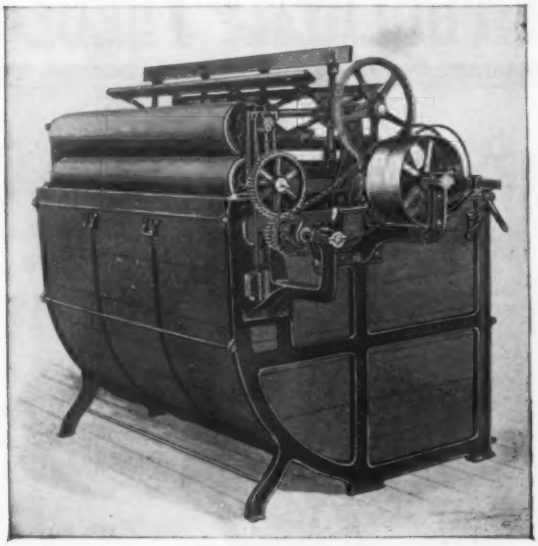

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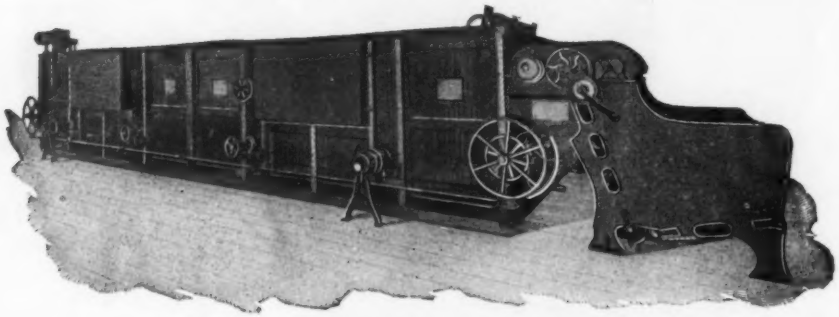

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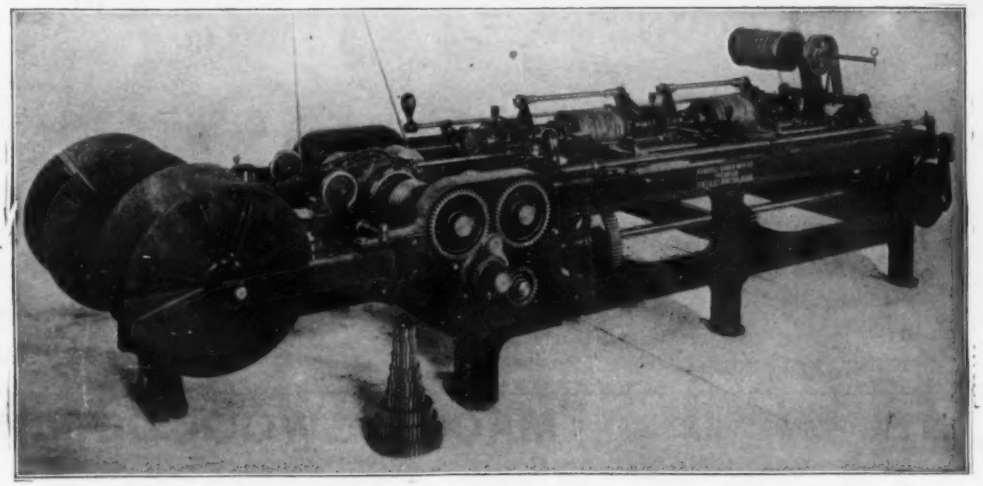
Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



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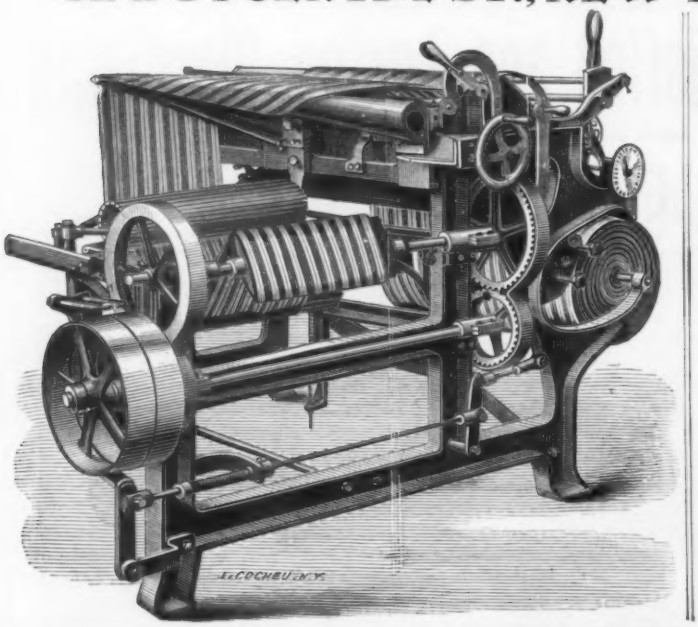

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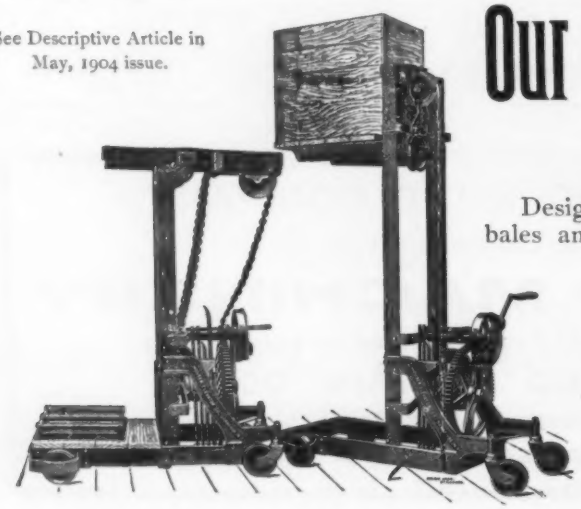

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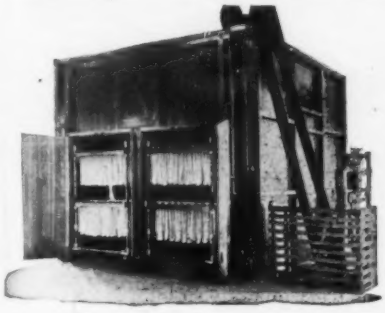

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On Exhibition at the Bourse, Philadelphia.

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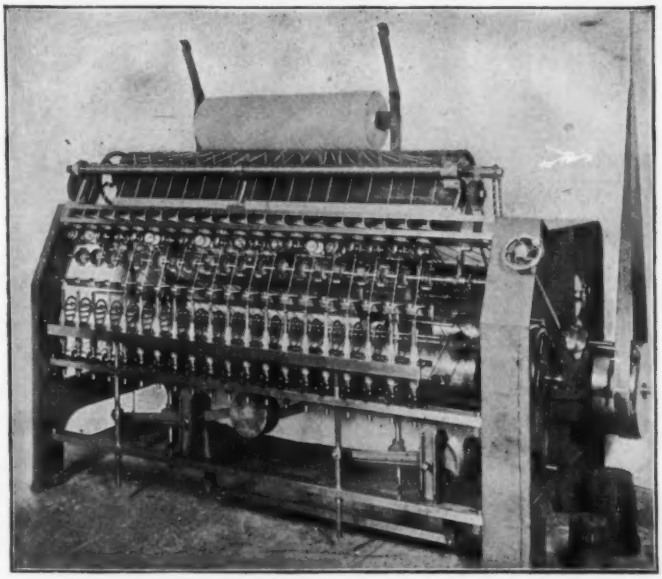

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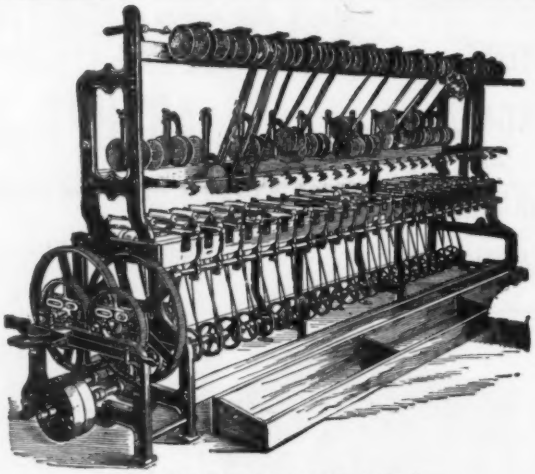
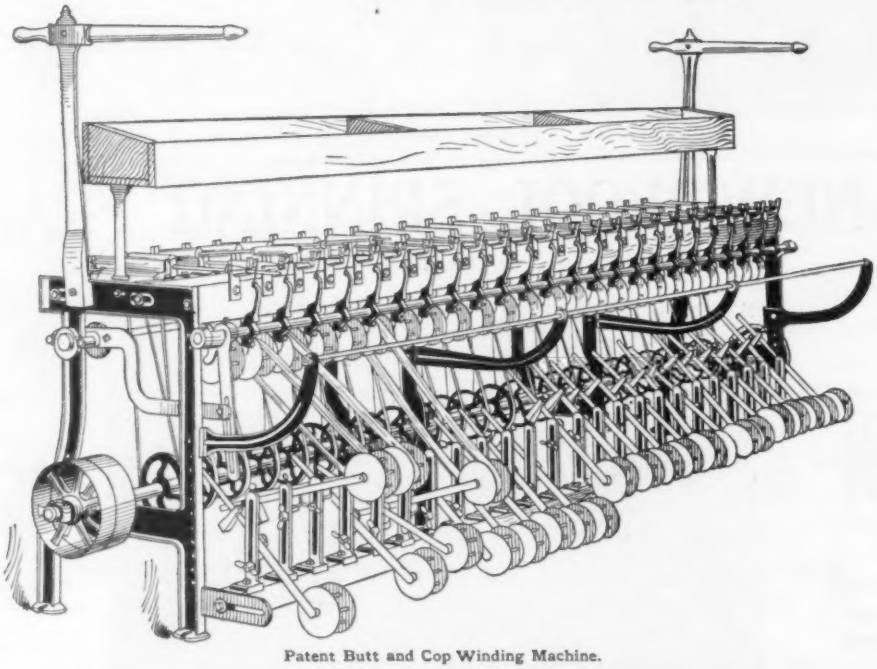


Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



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Wind Cones
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for
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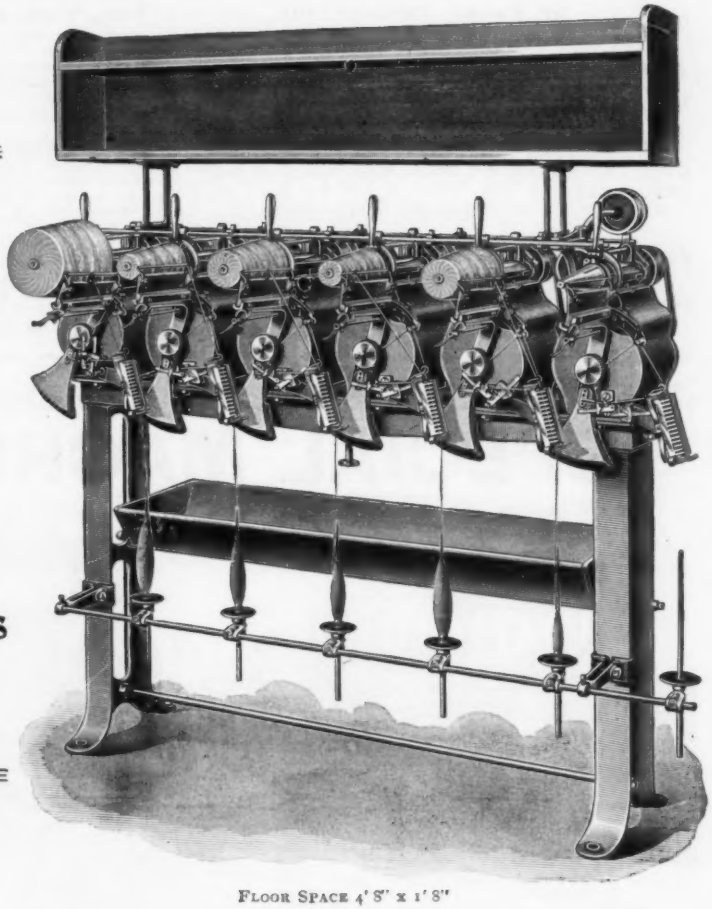

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They Combine { **Durability, Compactness, Simplicity, Economy.**

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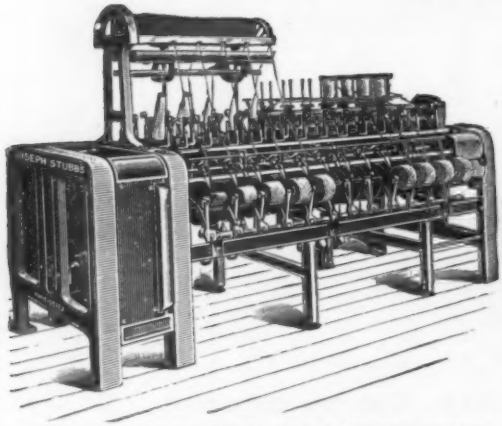
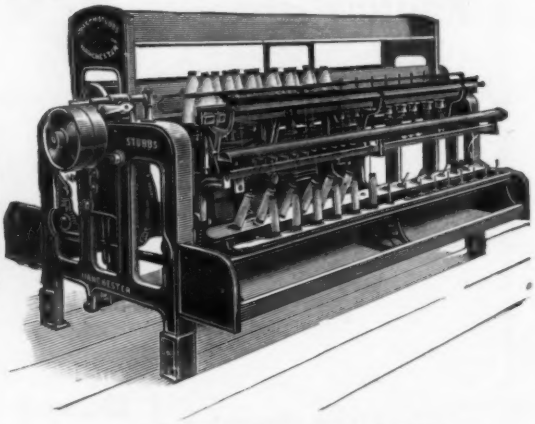


PATENT QUICK TRAVERSE COTTON GASSING FRAME.



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With Patent Tapering Motion, for Single Flanged Bobbins.

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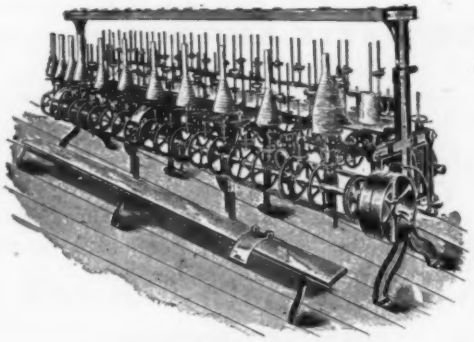

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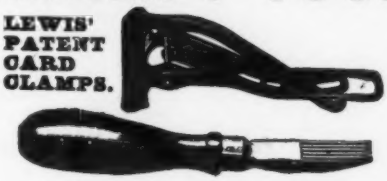

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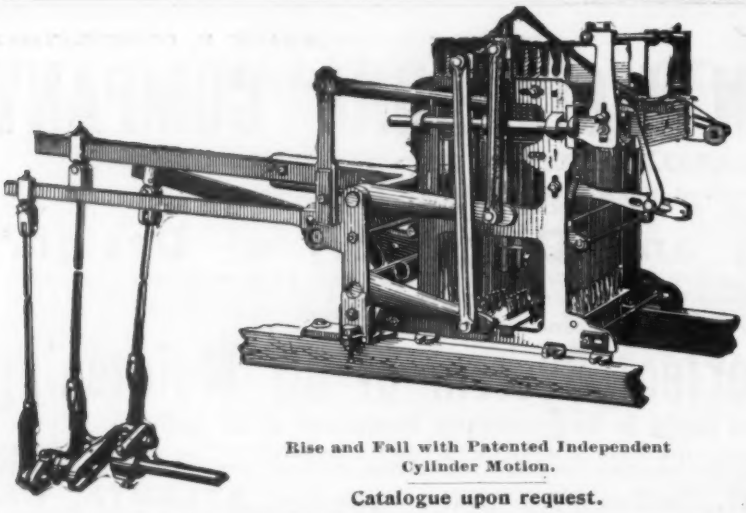

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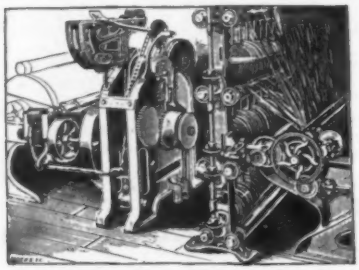

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With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

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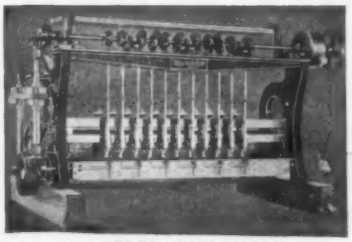

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FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

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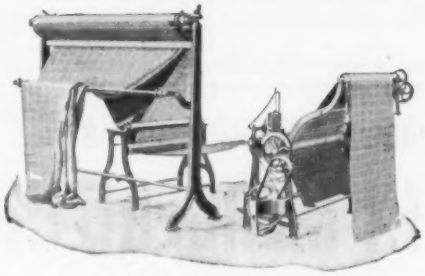
WOOL BURRING and PICKING MACHINERY

CLOTH FINISHING MACHINERY



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Curtis & Marble Mch. Co.

WORCESTER, MASS.

CIRCLES, HACKELS, GILLS, FALLERS and PORCUPINES.
CIRCLE KNIVES TO ANY PATTERN.

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Manufacturer of

MACHINE WOOL COMBS

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The Best English and American

CAST-STEEL PINS.

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Long Distance Telephone. Philadelphia, Penn.

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AND GRINDERS

T. C. Entwistle Company

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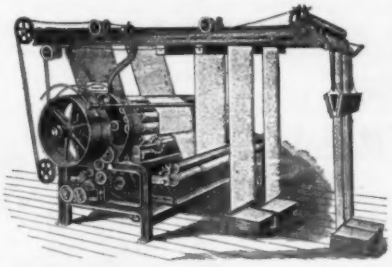
ECLIPSE NAPPING MACHINE.

Fabric in Direct Contact with the Napping Rollers all around the Drum.

Greater Production. Better Finish. Easier Threaded. No Shifting of Filling. Better results than can be obtained with teasels.



Long or short nap as desired on cotton or woolen goods, from the lightest to the heaviest.

No heavier napping on the sides than in the centre.

RICHARD C. BORCHERS & CO.,

Cor. Womrath and Tackawanna Sts.,

Sole Manufacturers in the United States. FRANKFORD, PHILA., PA.

WILLIAM SCHOFIELD CO.

Krams Ave., formerly Church St., Manayunk, Phila., Pa.

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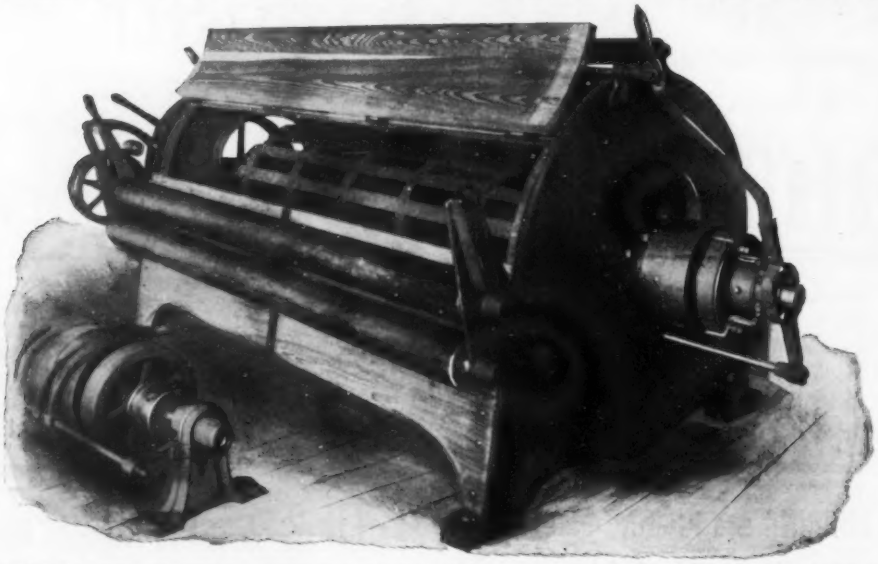
Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.

Special Machinery Built General Machinery Repairs

Relagging Picker Cylinders a Specialty

Eaton's Horizontal Cloth Extractor



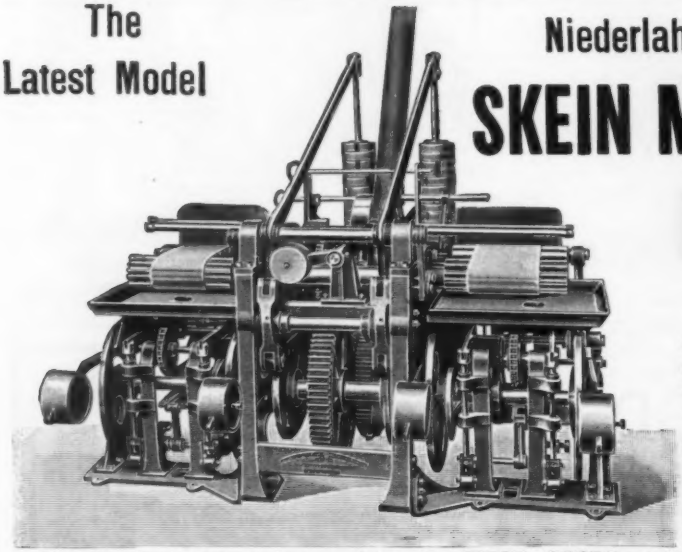
This machine will extract the liquid from woven goods of thin or medium weight. Practical men will see at a glance its advantage over the ordinary hydro-extractor. It does not wrinkle or distort the goods or disturb the nap, and therefore especially valuable for face goods. It is built very heavy and strong, and can be run at high speed with less danger than with the ordinary extractor. The goods are run on to the drum at slow speed and properly secured, and then run at high speed, causing the water to be extracted. The cloth is then unwound slowly by a reverse motion. Price reasonable. **Horizontal Extractors and Improved Cloth Felt Roller Hardeners, Felt Sand Papering and Felt Strip Cutting Machines.**

WYMAN EATON, Builder, Dolgeville, N. Y.

The Latest Model

Niederlahnstein Automatic

SKEIN MERCERIZING MACHINE



(Pat. "Hahn")

The advantages of this latest system are so great that it is economy to substitute it for existing machinery. This has been done by numerous Continental works. In addition to a rational and economical method of handling material, the machine offers great advantages in the smallest consumption of alkali and the highest lustre

Also the best mercerizing machine for **PIECE GOODS** and **KNIT GOODS** which has proved very successful.

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Niederlahnstein on the Rhine, Germany.

American Agent, L. H. A. SCHWARTZ, 186 Devonshire St., Boston, Mass.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,

Salem, Mass., U. S. A.

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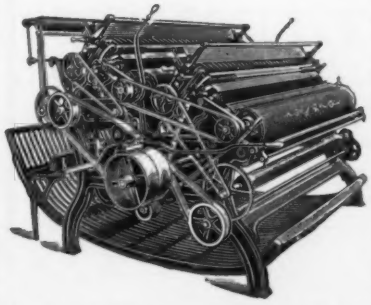

The Finest Shearing Machine in the World. Get into line. Use Double Shears. We will take your Single Shears in trade. Our representative can interest you. He will call at a word from you.

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SUCCESSORS TO SILVER & GAY CO.

Manufacturers of

Automatic BALL WINDERS, adapted to all kinds of Twines, Silks and Floss. QUILLERS and REELS. Also SPECIAL MACHINERY from DRAWINGS or PATTERNS.

Repairing, Turning and Refluting Worsted.

Spinning and Drawing Rolls a Specialty.

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We are still making

THE BEST MILL CRAYON

in Fifteen Colors for COTTON, WOOLEN and WORSTED MANUFACTURERS.

Original Makers Samples Sent

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Established 1844.

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(WM. J. BUCKLEY) **Gun Mill, Patterson, N. J.**

Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

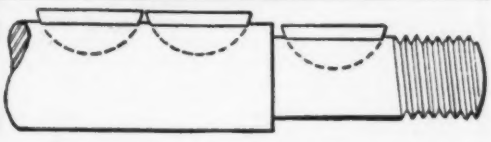
Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

Key Seating Attachment

FOR

Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

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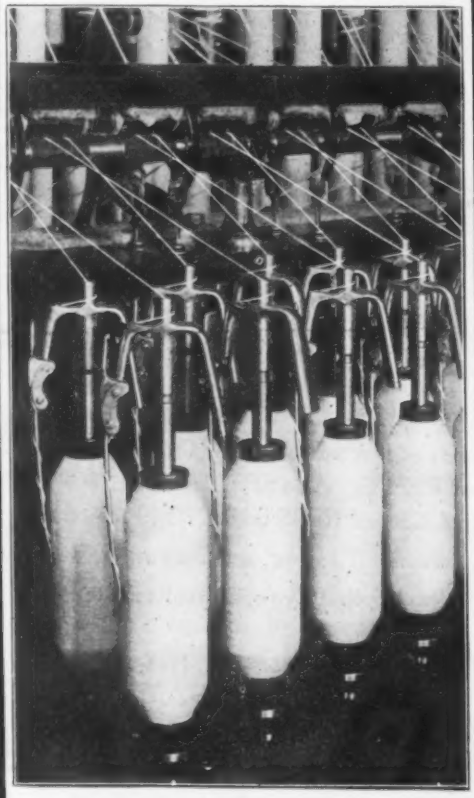
THE DUNN FLYER

Presents new principles and methods in Flyer construction that have proved their value and made its use of marked advantage.



3½ Inch Diameter Bobbins

are built with 7x3 Dunn Flyers on 4½" space frame with the further advantage of being able to run as fine as 15 hank roving on same flyers. Further information may be promptly obtained by addressing the

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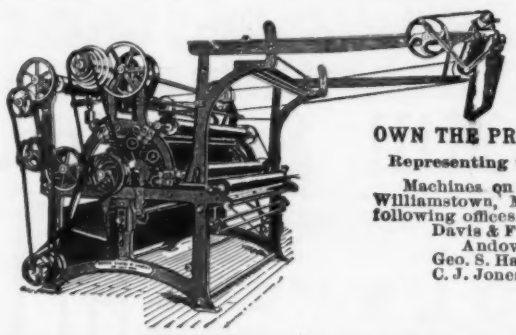

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Machines on Exhibition and Samples Napped at North Andover and Williamstown, Mass., or Philadelphia, Pa., on application to any of the following offices:

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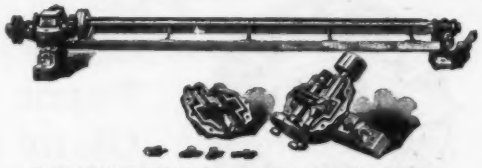

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1. For Cotton, Woolen and Worsted Cards
2. Can be run at highest speed
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1. Increases production 10 to 40 per cent.
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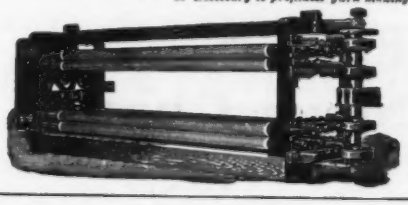
4. Equipped with perfect Aprons, plain or "pocket"
5. Now working on every grade of stock carded
6. Necessary to profitable yarn making



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Patent Flexible Steel Bed. Pressure automatically appplied by power.

1 6/4 double bed second-hand press
1 8/4 " " " "
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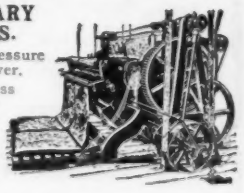

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AMERICAN SUPPLY CO.,
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Thread and Silk **SPOOLS** of any description.

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The eyes of our harnesses are always of uniform size, and of just the right shape to produce the least chafing of the warp, and the treatment they receive in the process of making the harness, fixes them so they retain their size and shape even when the harness is worn out.

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Paper Cloth Boards
For Textile Mills

All weights and sizes furnished by thousand, ton or carload. Prompt delivery assured. Samples and prices on request.

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For PLAIN and FANCY WEAVING.

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The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

THE STIRRUP IS ALWAYS IN PLACE.
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Somebody Gets Hurt

Cut of No. 1

Nobody knows what to do or has anything to do with, until the doctor comes and every minute's delay counts against the injured.

THE STANDARD ACCIDENT CABINETS

Are designed for just such emergencies.

CONTENTS.

6 rolls linten bandages	.	2	in.	2 packages absorbent lint.	
6 " " "	.	2 1-2	"	2 " " cotton, 1-4 lb.	
3 " cotton "	.	1 1-2	"	1 12 oz. bottle carron oil.	
3 " " "	.	2	"	1 12 " " arnica.	
3 " " "	.	2 1-2	"	1 roll adhesive plaster.	
3 " " "	.	3	"	1 package iodoform gauze.	
2 packages first aid for wounds.				1 pair scissors.	
2 " linten gauze.					

These Cabine's contain only the highest grades of medicines and bandages which are thoroughly sterilized and antiseptic. Send for Circular. Price No. 2, $10.00; No. 1, $5.00.

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Manfrs. of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers. Measuring Machines, Reelers, Singeing and Finishing Machinery. Special machinery.

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SAVE
Their Cost
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THE CHAFFEE PATENT CLOTH BOARD,

Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.

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BOX SHOOKS and CLOTH BOARDS.

Clean
LIGHT
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Shaw's "Victor" Travelers

Manufactured by

VICTOR SHAW RING TRAVELER CO.

Incorporated 1899.

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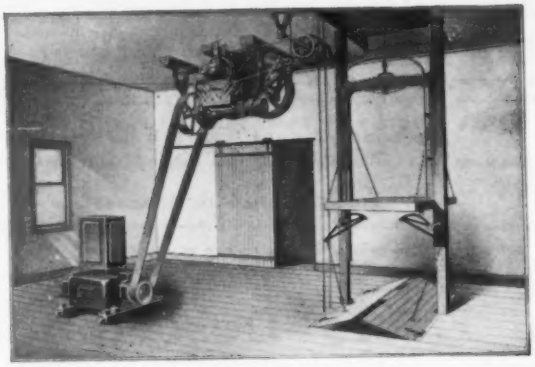

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Screw Electric FREIGHT ELEVATOR

Moderate Cost, especially if you buy f.o.b. Phila., and have your own mechanic erect from our drawings.

Economy in Running—Current used only while car is in motion—proper counter-balancing—**Hindley Worm Gearing**—few repairs.

Safety—Safety clutch on car, automatic stops on machine, **switch directly on machine** (instead of at the end of a chain). Elevator substantial throughout.

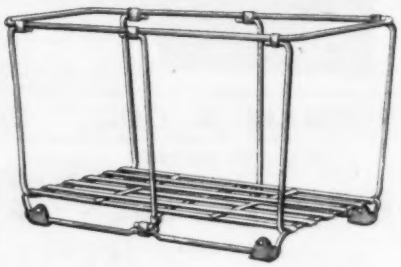
Any size, capacity or speed, direct or alternating current.

Full information on request. Correspondence solicited.

MORSE, WILLIAMS & CO., Philadelphia and Boston

A Mill Basket
That does not need continual repairing

Is the one to buy.



The frame of our Duck Basket is made of high grade steel joined together by seamless steel tubing into which the various parts are driven. This frame cannot work loose and break through the duck covering. Send for Booklet No. 4 which describes these baskets fully.

MORRIS & CO., Groveville, N. J.

The Lane Patent Steel Frame Canvas

MILL BASKET

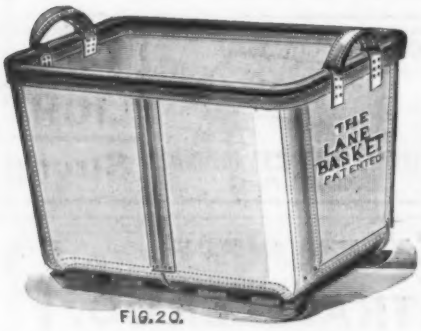


FIG. 20.

Embodies desirable features not found in any other basket. It is made of strong, smooth, cotton duck, doubled at all points of extra wear or strain.

The Frame is made of specially drawn round spring steel, put together with our semi-flexible eye joints, making it strong and sufficiently rigid, yet springy and resilient, and will stand the most severe use.

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Eight Thousand Sets in Operation in This Country and Europe.

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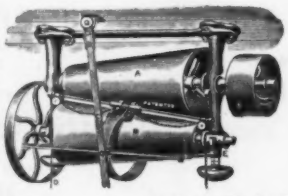

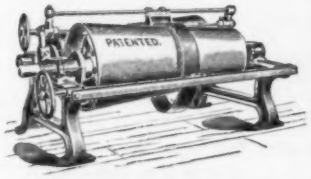

Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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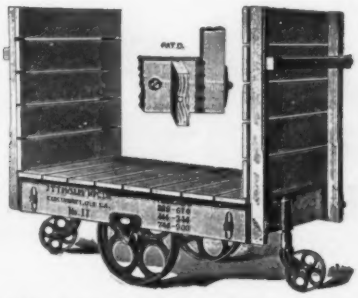
TRUCKS For Dye Houses, Finishing Works, Cotton or Woolen Mills



No. 11

Platform 24 x 48 in. Ends 24 x 30 in., wood work of hard maple.

Iron work all malleable, except centre wheels. All trucks shipped K. D. flat at lowest rate. Prompt shipment and satisfaction guaranteed.

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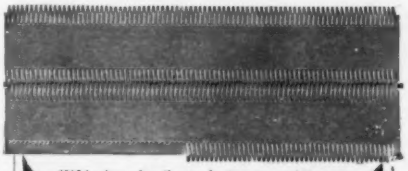

6000 inches of coil-wire lacing goes with every

Jackson Belt-Lacing Machine

purchased. This will lace as many belts as $75.00 worth of lace leather, a price which practically pays for the machine.

See the point?

The advantages are all explained in our booklet.

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Agents. J. D. McIlwain Co., Pittsburg, Pa.; E. A. Kinsey & Co., Cincinnati, O.; Chas. F. Belsey & Co., Chicago, Ill.; W. R. Colcord Machy Co., St. Louis, Mo.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of

HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

PROVIDENCE, R. I.

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WHERE TO LOCATE YOU ON THE LEHIGH VALLEY RAILROAD, IF YOU WANT TO ESTABLISH A NEW INDUSTRY OR RE-LOCATE ONE ALREADY ESTABLISHED.

P. H. BURNETT, Industrial Agent,

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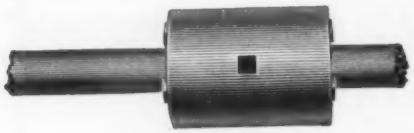

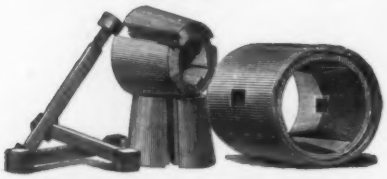

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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

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PULLEYS,
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and all most approved appliances for the Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

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Singeing Machines

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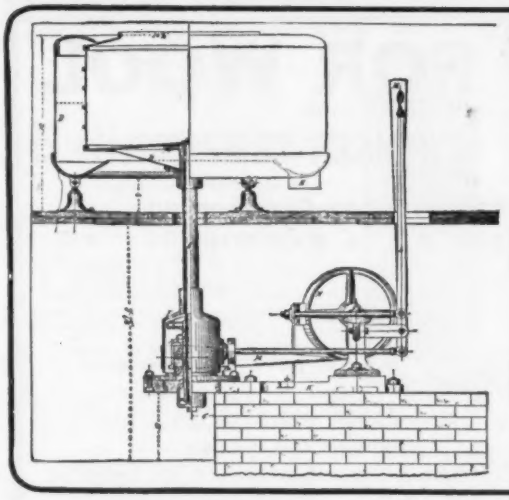

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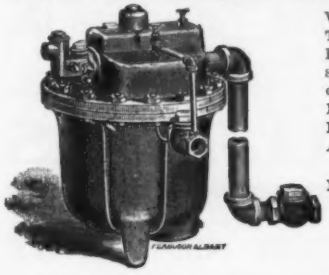

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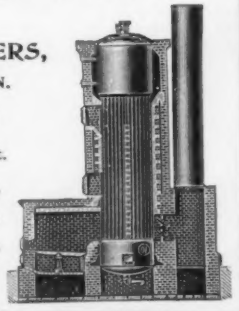

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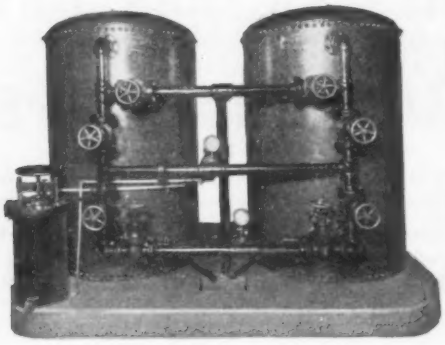

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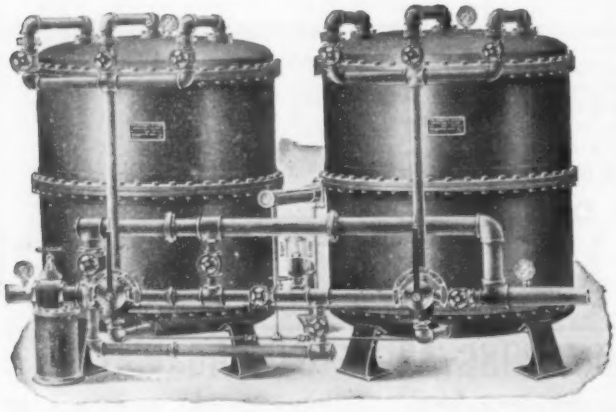

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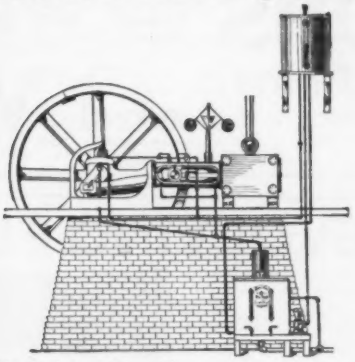

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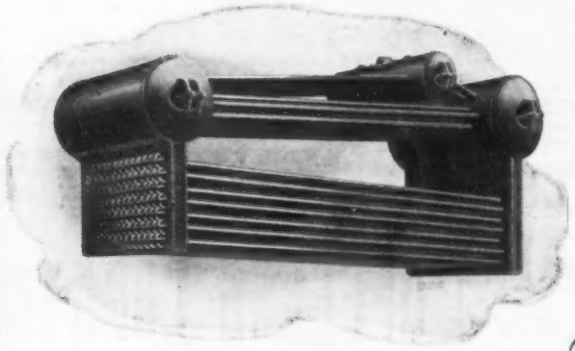

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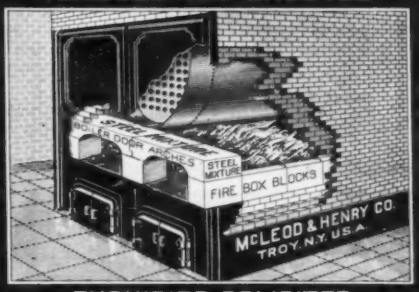

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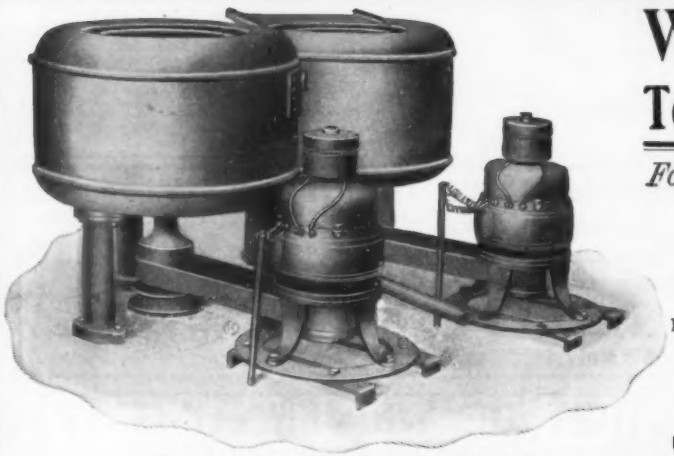

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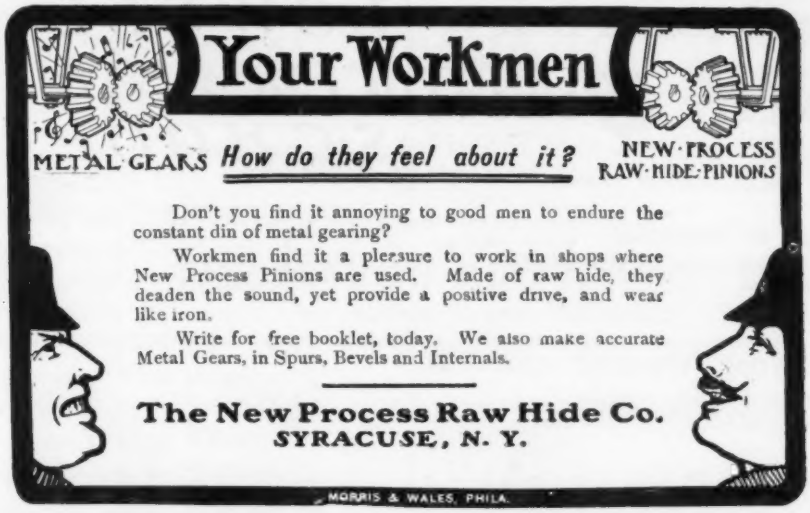
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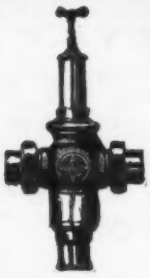

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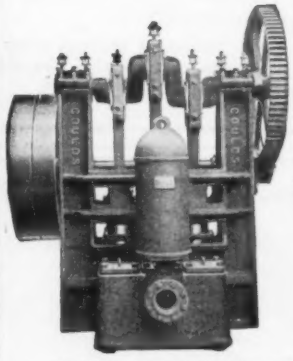

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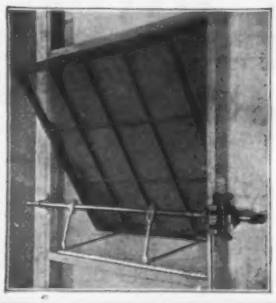

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for 1904

The Annual Official Directory for 1904, compiled by the Textile World Record, is now ready for delivery

Abstract of Table of Contents.

PART I. Textile Manufacturers.

Textile Establishments of the United States and Canada
Alphabetical Index of all mills in the United States and Canada.
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Number of Spindles and Looms in the United States.
25 Textile Maps, showing location of cities and towns where there are mills.

PART II. Yarn Index.

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List of Yarn Dealers and Agents.

PART III.

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PART IV.

Dealers in Raw Materials.

PART V.

Agents and Buyers of Textile Fabrics.

PART VI.

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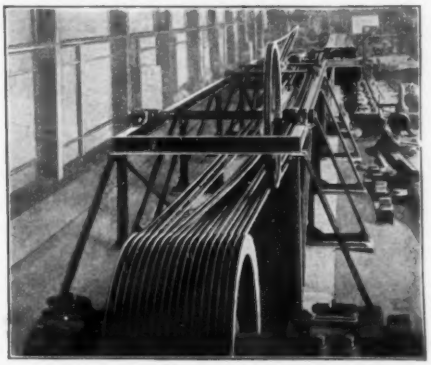

H. E. Walmsley, President of the New England Cotton Mauufacturers' Association, said, at their last meeting in Boston:—

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The Official Directory of the Textile Industries of the United States and Canada,

is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

The Directory of the Knitting Trade in the United States and Canada

is published early each year by Lord & Nagle Company It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $1.00.

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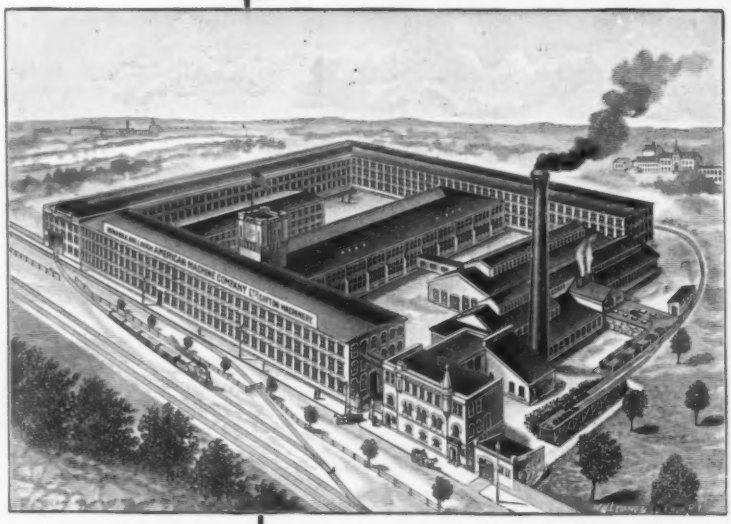

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The Textile World and Textile Record.

VOL. 27. (NEW SERIES.) SEPTEMBER, 1904 No. 6.

Monthly Comment.

Estimating the Cost of Textiles.

It is for the interest of every textile manufacturer not only that he should be able to estimate closely the cost of his own product, but that his competitors should also be able to estimate the cost of theirs. If a manufacturer has a faulty system of cost accounts he not only does not know the cost of his goods, but what is worse, he fools himself by thinking that he knows. If his estimate of cost is too high the selling price based on it makes the sale of his goods impossible. The mill is either shut down or run slack and the manufacturer waits in vain for the bankruptcy of his competitors who know how to calculate cost.

By estimating cost too high he injures himself alone. Not so, however, when the estimate is too low, as is more often the case. Then the goods are sold for less than cost and the manufacturer loses his own money and places his competitors in a position where they must sell at the same ruinous prices or let their machinery stand idle. Either course means a loss, all due to an imperfect system of figuring cost in other mills.

Manufacturers in a few lines, notably machine building, now recognize the benefit to all of an accurate system of estimating the cost by each one, and are consequently very willing to tell what they know about the process. Unfortunately this is not the case in the textile industry where manufacturers are very unwilling to disclose their methods of cost calculation. This secretiveness is due to an often commendable habit of keeping the details of their business from the knowledge of others. It is a mistaken policy, but nevertheless, one that is very firmly established. A manufacturer will rail at the stupidity of competitors who sell for 90 cents cloth that cost $1 per yard, because they think it costs 85 cents, and yet if he is asked to explain the correct method of figuring cost he will answer: That is my business. Do you suppose I am going to tell what my goods cost?

This attitude is due largely to the mistaken idea that it is necessary for a manufacturer to tell what his goods cost in order to explain how the cost is calculated. Nothing could be further from the truth. The important object for all is that each should know what his own goods cost. This can be done only by the aid of a scientific system of recording and estimating cost.

The American practice of converting the raw material into finished cloth necessarily complicates the calculation of cost. If a manufacturer buys yarn to be woven and finished the work of calculating cost is much simpler than if he buys the raw stock in the form of wool, cotton and shoddy. Whether

a perfected system of cost accounting is to be found in any of our mills is open to question. Each mill now uses a system evolved from its own experience. Too much stress can easily be laid on the importance of getting textile manufacturers to tell what they know about calculating cost. In the case of most of them their need of information is far in excess of their ability to impart it. The calculation of cost is a science in which textile manufacturing is far behind mechanical engineering, for example. To overcome this defect the reluctance of manufacturers to tell what they know about cost must be overcome and a sound system evolved by competent men.

Exports of Cotton.

The cotton exported during the 10 months ending June, 1904, amounted to 3,008,811,567 lbs., valued at $363,470,419, or 12.08 cents per pound. For the 10 months ending June, 1903, the amount was 3,401,933,372 lbs., valued at $303,607,376, or 8.92 cents per pound. The increase of over 3 cents in the price per pound enabled the United States to obtain from foreign countries for cotton in ten months $59,863,043 more for 393,121,805 lbs. less. This increase is equal to $199,540 a day, including Sundays, or $1,385 a minute. This stream of gold has enriched the South and contributed to the prosperity of all parts of the country.

Conditions in French Textile Mills.

Americans cannot keep too clearly before them the fact that misery and despair is the lot of most textile operatives outside of the Dingley tariff wall. Henry Siegel, president of the Simpson-Crawford Co., New York, recently returned from a visit to France and is reported to have made the following statement regarding the desperate conditions of the French operative:

"I wish I could describe the life of the average workman in the factories in the south of France. Emaciated almost to a skeleton, they toil day and night over their looms, barely keeping body and soul together with a little cheap wine and less bread. Ignorant, gaunt creatures, they rise in fury when an improvement in machinery is suggested, fearing that the little they get, never more than $4 a week, will be taken from them. Ii is a wonder to me that they are willing to live. Think of little girls and boys over 14 years of age working for eighty cents a week."

Imported Wool and Woolens.

Our foreign trade in wool during the past year, ending June, 1904, was, as usual, confined almost wholly to imports. Only 31,900 lbs. found its way out of the country while 173,700,000 lbs. were brought in. The imports were valued at $24,810,000, or 14.3 cents per pound. Estimating the woolen goods imported during same period as equivalent to 52,500,000 lbs. of grease wool, the total imports of wool and woolens represent 226,260,000 lbs. of grease wool, or, after a shrinkage of 30 per cent., 158,382,000 lbs. clean wool. Adding 125,000,000 lbs., the estimated scoured weight of domestic wool, the total is 283,382,000 pounds, of which 56 per cent. is imported.

During the year just closed the imports of woolen goods amounted to $17,520,000, a slight decrease from 1903, when the total was $19,540,000.

Wages in Belgium.

The frequent disputes between employer and employee abroad partially disclose from time to time the real condition of the foreign operatives. The textile industry of Verviers, Belgium, has been much depressed for some time past and the employers have given notice of a reduction of wages and an increase of the working time from 11 1/2 to 12 1/2 hours per day. The operatives replied to this that, while they were willing to work one hour longer each day, they could not accept a reduction of wages. The accounts of the dispute in foreign journals state that wages are fairly high in Verviers, the spinners earning 5 francs ($1.00) per day, and that, consequently, the Verviers manufacturers find it impossible to compete with the mills in other districts where wages are much lower.

This simple recital of facts should be taken

to heart by American wage earners, who are separated from direct competition with Belgian conditions by a tariff law that can be repealed whenever a majority at Congress and the President of the United States are so disposed. Think of a place where six dollars a week is considered high wages, and where the workers toil 69 hours for such a pittance. Think of a country where men and women are willing to work six hours longer, or 75 hours, providing their wages of six dollars are not reduced. Think of a country where employers are forced by business conditions to notify their employees that not only must such wages be reduced but that the working hours must be increased in order to avoid bankruptcy for the mill.

There is probably no country on earth which can match Belgium for a combination of low wages, long hours, improved machinery and skill in the manufacture of cheap shoddy goods. To lower the tariff bars and admit the textile products produced under Belgian conditions would result either in the destruction of the American industry or the lowering of American wages to the Belgian level. That this is not an extravagant view is proved by the experience of Canada, where a reduction of the tariff to 23 1/2 per cent. on English goods has practically ruined the Canadian industry. Wages in England, however, are higher than in Germany and the working hours are much shorter, English mills running 54 hours per week as compared with 69 hours actually worked and 75 hours proposed in Belgium.

Textile Manufacturing in Russia.

The war with Japan has caused a severe depression in the textile industry of Russia. For two years previous to the attack on the Russian fleet at Port Arthur trade had been extremely bad. Since that time many mills have been forced to suspend operations entirely, and most of those still in operation are running but four or five days per week. It is estimated that 40,000 hands are unemployed in the Lodz district alone. Free soup houses have been established by the local authorities, charitable organizations and some of the manufacturers to relieve the distress.

One cause of this loss of business is that the Siberian railway is now used exclusively for the transportation of troops and war material. This cuts off the Russian mills from access to Asia by land, while Japan has stopped traffic by sea. The Russian manufacturers are looking forward to a great revival of trade at the close of the war, when the depleted stocks in eastern markets will have to be replenished.

Disease Among Fullers and Dyers.

An article in this issue taken from a German paper shows that in many German woolen mills the operatives are suffering from a disease which is said to result from contact with chrome discharged from the goods during the fulling process. The theory as to the cause of the epidemic is plausible, but it does not seem as if the fullers in American mills handled the goods enough to cause the same trouble. The old style hammer fulling mill is still in extensive use in German mills and it is necessary for the operators on them to handle the goods much more during the process of fulling than is the case with the rotary mills which are almost exclusively used in this country. While, therefore, the epidemic is not likely to break out in our mills, the experience of German workers with it may easily prove of value in special cases in our mills where the operatives are required to come in contact with goods containing chromic acid.

A Premium on Temperance in Textile Mills.

Under the caption, "Against the Devil of Drink, the Worst Vice of the German People," The Leipziger Faerber Zeitung gives an account of the plan adopted by F. Brandt in his weaving mill at Gladbach, Germany, for encouraging habits of temperance among his employees. This plan is explained in the following notice that was posted in their mills in 1884:

AN EARNEST WORD TO ALL EMPLOYEES IN THIS MILL.

The Imperial statute provides that: "Workmen found drunk in a mill can be discharged without notice." It is also provided that habitual drunken-

ness outside the mill, if persisted in after warning has been given, warrants the employer in discharging the employee. The law also strictly prohibits carrying liquor into the mill. For the reputation of this mill and especially for the benefit of the workers and their families, these provisions of the law will be strictly enforced. It is a fact that many families suffer from lack of food and endure great privations because the head of the family is addicted to drink; that love of family and home is often destroyed because the father and sons frequent the ale house; that many young workers are contracting the drink habit; and finally that drinking in the mill offers the first temptation to many young people. Drink is the ruin of many and total abstinence is unquestionably the best course. Liquor must be kept out of this mill. In order to give workmen who have heretofore been temperate the proof of our appreciation, and in the hope that in the future many others may be led to follow the same course, the following plan has been adopted:

Every mill worker over sixteen years of age who abstains entirely from drink will receive 1 mark (25 cents) monthly. This amount will be paid with the regular wages and without further notice. A written certificate of the workman will be accepted as proof that he has not used liquor as a beverage in the mill or outside of it during the current month. This certificate will read as follows: "I, the undersigned, declare that for the past month I have not drunk any kind of liquor or bitters." Blank certificates can be had at St. Joseph's House and in the coffee room, also upon application to the mill overseer. Only the overseer and two other trustworthy persons will know who signs the certificates, thus every one can be confident that the matter will remain secret. I have confidence that no one will make a false declaration. Should, however, one be so unprincipled as to sign a false certificate he will, upon detection, be immediately discharged, and any sum he has received in consequence of his deception will be deducted from his wages. Many may consider the amount (1 mark per month) very small, but they should bear in mind the great advantages that will accrue to them by reason of their abstention from drink. This plan will continue for three years. F. BRANDT.

August 30, 1884.

The premium plan thus inaugurated twenty years ago is still in force and has proved its usefulness. More than one-fourth of the workmen receive the premium. No deception has ever been practiced. The plan has been the means of inducing many to abstain entirely from drink and many young people have been kept from acquiring the habit.

American Hosiery Abroad.

The American consul at Chemnitz, has sent home a curious report, which he calls the "synopsis of a conversation with an importer of American hosiery and underwear into European countries." This importer gives Americans a large amount of advice as to how they can obtain and retain foreign markets. Information on this subject is greatly needed, especially in respect to foreign markets for knit goods, and the advice, despite its somewhat questionable source, will be read by American manufacturers with a proper sense of their shortcomings and willingness to adopt suggestions for their correction.

Sheep or Dogs.

At a time when the consumption of wool appears by the best statistics available to be increasing faster than the production, attention is called very opportunely by Prof. Thomas Shaw to the damage to the wool clip by dogs. It is surprising that the production of wool, so essential to the existence of mankind in temperate and cold climates should continue to be restricted by worthless cur dogs. Prof. Shaw in the American Sheep Breeder and Wool Grower writes as follows:

The greatest menace to the sheep industry at the present time is, in the judgment of the writer, the dog industry. Where the latter flourishes the former wanes. Locality after locality could be named in these United States where, in former years, the sheep industry flourished, while now it is conspicuous by its absence. Any careful reader of the American Sheep Breeder cannot fail to have noticed that the cry with reference to this matter which comes up from every state in the Union is the same. The losses in these from the ravages of dogs stands as a barrier in the way of sheep extension. The wail of shepherds over the loss of flocks thus destroyed or partially destroyed reaches from the Atlantic to the Pacific, and from the Gulf to the Canadian boundary. This dog menace is worse than any menace ever caused by wolves. Worse than the gad fly or gid or nodule disease or lung worms or stomach worms or tape worms or adverse tariffs; worse than all these combined, we regard it as the great giant standing at the gateway of the attempted extension of the industry and threatening to destroy it if it shall dare to move forward. One of the worst features of this evil lies in the fact that it becomes more aggravated as population increases. On the ranges the losses of sheep from dogs are few indeed. As towns grow and cities enlarge, the sheep industry recedes from them. The opposite result should follow. The writer has been urging farmers to keep sheep on their farms if for no other purpose than to furnish mutton for the family. But how can this be successfully carried out near towns and cities without corraling the sheep at night? Where is the farmer who can afford to grow mutton to be devoured by his neighbors' curs? Viewed from this standpoint the evil is appalling in its magnitude.

Why should this magnificent industry be thus harassed and preyed upon? What is it all for? Can the legislators of the United States answer that question? It is for the sake of what other industry? Why, for the sake of the dog industry and why should the dog industry be so important?

The Markets of the World.

THE MARKETS OF THE WORLD.

During the years just preceding the advent of the Wilson free wool tariff bill there were five textile manufacturers in this country who advocated the reduction of the McKinley duties so loudly and continuously that they became popularly known as the textile quintet. The keynote of their song was: "Give us free wool and we will capture the markets of the world." They got free wool, but instead of capturing the markets of the world they lost the home market under the avalanche of foreign goods produced by cheap foreign labor. Pride of opinion led the members of this quintet to run their mills under the Wilson bill long after a shut-down was imperatively demanded by the most ordinary business prudence. The five free traders comprising the quintet were all very wealthy men, but one after the other was forced by the heavy losses in manufacturing to put his pride in his pocket and curtail production. To our personal knowledge one of them directed his mill manager to accept an order at a price below even the estimated cost in order to keep the looms in motion. This was at a time when the actual cost had mounted far above the estimate because of the deficiency in the volume of business. The evil times which overtook this wealthy quintet brought still greater disaster to the thousands of men throughout the country who had their all invested in the business of manufacturing textile goods. Surplus was converted into deficit and bankruptcy stalked through our mills. In the business depression caused by the Wilson-Cleveland-Gorman bill some of the oldest and most substantial firms were swept out of existence and a succession of failures began which is not yet ended. It is but a few months ago that a textile manufacturer who, by great natural ability and a life time of industry had amassed a fortune, failed and died a poor man because of losses incurred in the black years following the election of Grover Cleveland in 1892.

Since their experience with the free wool for which they clamored the survivors of the quintet have been silent. No longer are they found in public places telling the people that their mills would run night and day if they had free wool. No longer do they fill columns of the Boston Herald with mathematical demonstrations that free wool would give America command of the wool goods market of the world. No longer do politicians who do not know the difference between a mixing picker and a miss-pick, point to them as final proof of the undiluted blessings of free trade.

The world has moved since the quintet and the professors in our colleges from Maine to California, and from the Great Lakes to the Gulf, publicly proclaimed the evils of a protective tariff. Protection is now the settled policy of nearly every nation on earth. England, which has ever been held up as a shining example of free trade is the scene of a determined struggle by a powerful party to adopt a protective tariff. The woolen industry of Canada lies prostrate as a result of low preferential duties. The history of the past twelve years and the present world wide trend toward protection has made even the great free trade party of America pause. The recollection of Cleveland times is too fresh in the minds of the people to afford any hope of a return to the free wool delusion. The friends of American industry should not forget, however, that the twelve years that seem so short to the man of forty is an age to the man of twenty-one who casts his first vote in 1904, and who was a child of nine years when Grover Cleveland was elected president in 1892 on a platform pledged to free wool.

For this reason the friends of American labor and industry should resolve to keep the bitter lessons of the past before the public. No matter how weak may be any braying for free wool they should remember that it carries the threat of business disaster and should meet it with the demand that the man who asks for free wool shall prove its advantages by the experience of the past. Promises and opinions are not enough.

AN EPIDEMIC AMONG GERMAN DYERS AND FULLERS.

For a number of years the employees in the dyeing and fulling establishments throughout Germany have been suffering with a skin disease which in most cases was confined to the hands and arms. The disease has spread widely during the last few years and has recently been the subject of a government report, the outline of which is as follows:

The employees in the fulling department of woolen mills have suffered with a disease of the skin which consisted of itching pimples and bunches, particularly on the hands and arms which were uncovered while the operative was at work. The disease was mentioned by medical writers as early as 1878. At first it was confined to isolated cases, but in recent years has extended so as to become quite general. A few fulling establishments are free from it. Recently it has also broken out in dye works. In Forst, where the disease is most prevalent, out of 202 fullers in 69 mills, 35 in 24 mills were suffering from the disease. At the same place 7 dyers were attacked. In Cottbus, of 90 fitters in 35 mills, there were 8 victims in 5 mills besides one dyer. Usually the sufferer is able to continue his work, and only eight cases were found where the fullers were compelled to change their occupation. The district doctor at Forst refers to the disease as follows:

"Frequent and sometimes uninterrupted contact of the hands and arms with warm or hot liquids or vapor cause a softening or disintegration of the skin which becomes chapped or cracked. The trouble is aggravated by continuing to work with the hands and arms in soap of chemical solutions. Itching pimples or postules form and are frequently rubbed off by the sufferer. This generally causes ulcers to form, which, however, are confined to the parts of the body where the skin has been removed. The disease makes its first appearance generally on the fingers and spreads to the hand and lower part of the arm. In some cases the patient complains of the loss of the sense of feeling in his fingers. This may be ascribed to the condition of the skin. The ulcers heal with difficulty and some of the sufferers have been compelled to change their occupation."

The fulling process has been changed but little in the course of time and today it is practically the same in all mills. To remove the oil from the cloth the pieces are first treated in a scouring machine with a solution of soap and soda, or a soap powder, which is a mixture of soda, soap and sulphate or carbonate of ammonia. Sometimes the cloth is fulled without previous cleansing in which cases it is first treated in the hammer fulling mill. The cloth is then washed and again fulled in a rotary mill, the object being to shrink the fabric to give it solidity and strength and prevent subsequent shrinkage. Almost without exception the persons afflicted with the disease state that they acquired it while engaged in the preliminary process of fulling the goods before they were scoured, and that the danger was particularly great when the cloth bled, that is to say, when the dyestuff from the goods colored the fulling liquor. Furthermore, it has been established that no soap boiler or other person engaged in handling soap or soap solutions, such as washwomen, had been troubled with eczema on the hands and arms. Nine cases of the disease were also observed in which the patients, dyers, had come in contact with acid solutions but very little or not at all.

The conclusion was drawn from these facts that the cause of the epidemic was not to be found in the use of soap or soda, but rather should be sought in the dyestuff or mordant. It was also observed that the disease only appeared in those mills, as in Forst and Cottbus, where the material was dyed in the wool or yarn. Spremberg and other places where the goods were generally fulled in their natural condition and subsequently piece dyed were practically free from the disease. The only two sufferers in Spremberg were working on dyed goods.

For a long time wool and wool pieces have been dyed almost exclusively with alizarine dyestuffs. Bichromate of potash, the most important mordant used today, was introduced more than fifty years ago. The only recent change has been in the method of application of these colors and mordants.

Formerly the wool was mordanted and then colored, two baths being necessary. About ten years ago the one dip method was introduced by which the dyestuff was first applied and then the material was afterwards treated in the same bath with bichromate of potash or soda, the second process being called after chroming. With the one bath process the material was first treated with a mixture of the required quantity of dyestuff with about 10 per cent. of glaubersalt and a certain quantity of acetic or sulphuric acid. Then some sulphuric or acetic acid and 1 to 3 per cent. of bichromate was added to the bath. The one dip process is much quicker than the two dip method and the wool fibre is not subjected to such harsh treatment in the one dip as in two. There was also a saving in time, steam, labor, etc.

The one dip method was not introduced suddenly. It was adopted by a few mills at first and has gradually extended to others, until for the last four or five years it has been in general use. The outbreak of the fuller's disease to which we have referred is practically coincident with the adoption of the one dip method of dyeing. In one mill a fuller who had worked at his trade for thirty-one years had been a sufferer from the disease only for the last five years, while in another mill a fuller of twenty-nine years' experience had been a sufferer for only three years. In another mill a fuller had been suffering from the disease for three years although he has been constantly engaged in the same occupation for thirty-three years with the same firm. These cases represent the general experience of workmen in the different mills.

As contact with the alizarine dyestuffs, so far as known, does not cause the eczema and the same is true regarding glaubersalt sulphuric acid, acetic acid and other mordants such as alkali, alum, sulphate of iron in weak solutions, suspicion naturally pointed to the bichromate of potash and soda. It has been long known that bichromate has an injurious effect on the human skin. It remained, therefore, to be determined whether chrome was present in the fulling solutions. Six samples of the fulling liquor, taken from four different fulling establishments, were analyzed. In each of the six samples chrome was detected; in four of them the quantity of chrome amounted to 1.5, 2.94, 4.47, 6.35 grams per 10 litres respectively. Dr. Boettiger in Barmen had already observed in Chemnitz that weak solutions of bichromate of potash would cause eczema. Dyers who handled chromed yarn were attacked with the disease. One dyer was positive that he had acquired the disease by working in chrome solutions. An overseer of dyeing stated that he had noticed that one of his employees was effected with the eczema every time he had occasion to work in chrome liquor.

It was therefore concluded that the recent spread of the eczema was due to the fact that the material dyed in one dip discharged a greater quantity of chrome during the process of fulling. To test this conclusion two samples of wool were colored the same shade, one by the two dip method, the other by the one dip process. The former was mordanted with 3 per cent. of bichromate of potash and 2 1/2 per cent. of tartar, the latter was chromed with only 1 1/2 per cent. of bichromate of potash. Both the dyed samples were then handled in the soap and acid solutions in exactly the same way as is adopted in the process of fulling. The sample dyed with the two dip method revealed scarcely any traces of chromic acid. The other sample dyed with the one dip method, however, although but one-half as much bichromate had been used, discharged a considerable quantity of chromic acid.

A remedy for this disease has not been found at the present time. Gloves can not be used as the fuller must have his hands free for handling and measuring the cloth. Obviously a thorough scouring of the goods after dyeing would remove the surplus of chrome, but this method is not easily applied, particularly with goods that are dyed in custom dye houses. (Translated by the Textile World Record from Leipziger Faerber und Zeugdrucker-Zeitung).

The American Moistening Company, Boston Mass., has a large volume of business in hand for this season, with recent orders and installations amounting to over 1500 humidifiers. Manufacturers are taking a brighter view of the future, and many orders have been received from those desiring to avail themselves of the benefit of a moistening system during the coming Fall season.

Mercerized Worsteds.

The mixed fabrics to which the trade has applied the name, "mercerized worsteds," have sold freely during the present season and bid fair to retain their popularity. The name is, of course, a misnomer because the mercerizing process is applied only to cotton. It is derived from the use of mercerized cotton in mixed worsted and cotton goods. The latter have long been known as "cotton worsteds," a term that is as inconsistent with the facts as is "mercerized worsted." Mercerized worsteds are made of white or colored cotton yarn and grey worsted or woolen yarn. The wool is dyed in the piece by a process that does not affect the cotton. The finished goods thus show fancy effects which could be obtained heretofore only in wool or yarn dyed fabrics. As the piece dyed shade forms the ground color it has been found necessary in order to reduce the cost of the goods to substitute colored cotton for a part of the worsted. Mixtures of wool and cotton have also been used for the same purpose.

At first mercerized cotton was used for the fancy effects, but many styles have been made with unmercerized cotton for the fancy yarn. The term mercerized worsted has been retained, however, and thus made to cover a wide variety of fabrics. In making these goods manufacturers have had difficulty in dyeing the wool in the piece so that the color will penetrate the thread thoroughly. Many of the mercerized goods on the market can be detected by untwisting a ground thread and finding the centre to be of a much lighter shade than the outside. There have been other troubles such as streaks and clouds due to irregular dyeing. Some fabrics have been imperfectly constructed because of the desire to reduce cost. The well made and successful lines of these cloths have demonstrated their merit. They can be made at a lower cost than wool or yarn dyed goods. The general process of manufacturing mercerized worsteds is likely to remain a feature of the men's wear trade. They are easily made, but like every other fabric possess certain peculiarities which a manufacturer must understand in order to make them successfully.

The Italian Textile Industry.

A law is to go into effect in the near future prohibiting night work in Italian mills. It is reported that in anticipation of this law cotton manufacturers are enlarging and rearranging their mills so as to avoid interruption of the production. The development of the Italian cotton industry is comparatively recent, and due to the abundant supply of cheap labor and power. The native population supplies the labor, while the power is obtained from the never failing streams of Northern Italy that have their source in the melting glaciers of the Alps. These advantages have enabled Italian manufacturers to withstand the present adverse condition of trade better than has been possible with their foreign competitors.

About 1,800,000 acres are devoted to the cultivation of cotton in Egypt with an average yield of 340 pounds per acre.

The average daily wages paid to cotton mill operatives in Japan is 16 cents for men, 10 1/2 cents for women and 3 1/4 cents for children. The mills run 22 hours per day, with two sets of workers.

The cotton plantations in India are generally small, ranging from 5 to 30 acres in extent. The average yield is about 75 pounds per acre, with 17,000,000 acres under cultivation.

The Textile Finishing Machinery Co., Providence, R. I., has just made what is claimed to be the largest shipment of slashers ever leaving New England. The shipment consists of eight complete slashers loaded on four flat cars and one box car, making a total shipment of 100,000 pounds. Slashers composed of eight 7 ft. diameter 5 ft. face copper slasher cylinders and eight 5 ft. diameter 5 ft. face copper slasher cylinders with head sections, size box sections and creel frame sections, complete. Also 250 gallon iron size kettles. The cylinders were fitted with their improved Hunting Patent spiral scoops for removing the water. The above shipment was consigned to Erwin Cotton Mills Co. of West Durham, N. C., who now have a total equipment of 17 of these slashers.

THE NEW ENGLAND COTTON MANUFACTURERS MEETING AT THE MT. WASHINGTON HOTEL, WHITE MOUNTAINS, SEPT. 21st AND 22d.

The extensive program for the 77th meeting of the New England Cotton Manufacturers Association which has been arranged by its very efficient Secretary, Mr. C. J. H. Woodbury, has created a great interest not only among the members of the Association, but also among its many friends, and it is expected that the attendance at this meeting will be the largest for many years. Besides the magnificent program of practical papers by practical men, much attention and care has been given to the social features, and no place, in our opinion, could have been selected which would add more to the success of this meeting from the latter standpoint. The special train of Pullman cars leave the North Station, Boston, Tuesday, Sept. 20th, at 10.30 A. M. over the Boston & Maine R. R., and will arrive at its destination at 5.45 P. M., stopping en route for dinner at Plymouth.

The sessions will be held at the Mt. Washington Hotel and every possible arrangement for the comfort and convenience of the guests have been made by the proprietors of that famous hostelry. This palatial hotel which was recently erected at a cost of $1,250,000 is indeed an architectural and artistic triumph. "A palace in a paradise." Such is the term that most fittingly describes the Mt. Washington, the mammoth new hotel in the heart of the White Mountains. Few of the summer hotels can boast of such magnificent scenic surroundings. This hotel has been appropriately named for it stands in a location from which may be enjoyed a close and comprehensive view not only of majestic Mt. Washington itself, but of the entire presidential range. We bespeak a most satisfactory and pleasant time for the members of the Association who intend taking this trip and for any friends who may be fortunate enough to be numbered among them.

The full program will not be issued until the meeting, but papers are expected on the following subjects, and advance copies of any papers which are printed in time will be sent to any of the members on request:

Automatic Feed Water Regulators and Low Water Alarms for Boilers.

Business Side of Cotton Manufacturing.

Economic Extension of Cotton Cultivation in the South.

Electric Measurements of Power Required in Cotton Manufacture.

Electricity in Textile Mills.

Electric Transmission of Power.

Expanding Cop Spindle.

Hypochlorite of Sodium in Bleaching.

Moisture in Cotton and Cotton Yarns.

Novelties in Cotton Yarns.

Preparation of Warps.

Roller Covering.

Storing and Marketing of Cotton.

Tests of a 400 K. W. Parsons Turbine.

Theory versus Practice in Bleaching and Mercerizing Cotton Piece Goods.

The tickets for transportation, care of baggage, Pullman car seats, dinner en route, and stay at the Mt. Washington Hotel, can be obtained at the ticket office of the Boston & Maine R. R., 322 Washington St., cor. Milk St., Boston, Mass.; price $19.75.

Cotton Growing in Dutch Guiana.

Interest in cotton growing has been awakened in Dutch Guiana, and the government is offering substantial encouragement to the new industry. This Dutch colony with an area of 46,060 square miles, is about the size of Mississippi. The country lies near the equator and has a population of but 58,484, about equal to that of Hoboken, N. J. The torrid climate and the small supply of labor have not deterred certain persons afflicted with cotton hunger in Holland from forming an association for developing the cotton growing industry in Guiana. Ten pounds of cotton seed per acre is to be distributed without charge to the scattered inhabitants in the districts of Saramacca, Coronie, Nickeine. Three bounties, forty dollars each, are to be paid to producers of real cotton:

1. For the best product of 55 pounds.
2. For the best cultivated field of cotton.
3. For the best statement of experience during trials.

MILL LIFE IN INDIA.

BY GEORGE CECIL.

The danger to American and European textile industries from the production of goods by Indians, Chinese and Japanese who are satisfied to work for 3 to 10 cents per day is periodically held up as the Asiatic peril and predictions are often made that the higher priced labor of Europe and America must eventually sink to the Asiatic level. The rapid development of the cotton industry in India apparently confirms the prediction, but a closer examination of conditions in India tends to modify the opinion thus formed. The development of the Indian industry has been on very coarse yarn and cloth for which the cheap Indian cotton is especially adapted. While the low cost of labor has unquestionably been a factor in this growth it has so far failed to produce successfully the medium and fine goods which European mills supply to the Asiatic market. Indian labor is very cheap and very poor. Until its efficiency is increased by a better standard of living, which means higher wages, it is not likely to prove dangerous to the high priced and highly productive labor of Europe and America. Skilled English overseers are usually employed in Indian mills.

Although a large proportion of those Anglo-Indian men who return at intervals to their fatherland assure their friends and acquaintances that India is the finest country in the world, and life there is one endless round of pleasure, the fact remains that these people are so accustomed to their surroundings that they are not—with all due respect—able to express a reliable opinion. For, having left their own country to better themselves, they are so charmed when they return with their increased salary and other advantages that they do not mind several years of unpleasant exile.

HIS PROSPECTS.

A word as to the prospects of the Anglo-Indian mill man. These are, on the whole, distinctly promising. He receives, according to his agreement, an increase in his "pay," as one's salary is termed locally, and upon the completion of his agreement he is entitled to a free passage home. He has a bungalow, often a very excellent one, assigned to him, one or two native servants, and as he is in a position to know what the mill's output is likely to be he may make many friends among the shareholders, each of whom is ready to entertain him. Should he have social aspirations he has but to join a volunteer corps and he is eligible for presentation at a Government House levee, while his rank is a sure passport to the various official functions held in Calcutta, Bombay, and other parts of India. Should he make himself so useful to his employers that they cannot do without him, he is in a position to dictate his own terms,—and these may include a seat on the Board and a present of mill stock. However, it must be pointed out that there are not many instances on record of the Anglo-Indian mill manager having forced the hands of the managing agents in this manner; more often he is too satisfied with his position to try to improve it. Whether he is wise in following this policy of contentment is open to discussion, but there is no getting past the fact that nearly all Anglo-Indians allow their energy to succumb to the enervating climate.

THE COST OF LIVING.

Those stay-at-home mill men who have not had any experience in India are sometimes under the impression that living is cheap, and that hordes of black servants pine to be engaged at wages which would not keep an English housemaid in hair pins. Although the Indian domestic of twenty years ago was exceedingly moderate in his demands, things have altered very much and wages now are about fifty per cent. more than they were. Still the exiled mill manager has no difficulty in securing a cook who will work cheerfully for 9 rupees ($3) a month, while a bearer (general servant) is satisfied with from 8 to 9 rupees ($2.60 to $3). In the small provincial stations wages are even less and at Cawnpore, Rawal, Pindi and other places it is possible to find a native servant who will cook, look after his master's clothes, clean his boots, sweep the house, and do everything that may be required of him for 11 rupees ($3.75) a month. Nor are meat, bread, butter

and kindred supplies high priced, but should the new arrival object to tough and tasteless beefsteaks and mutton chops and pine for tinned lobster, jam and preserved fruits he will have to pay a high price for them. His wardrobe, on the other hand, will cost him but little, for except in the evening when he takes his pleasures abroad, he invariably wears a white drill suit which can be made by a native tailor, called durzi, for from 5 to 6 rupees ($1.66 to $2). It is worth noting that when the English mill man first arrives in India he pays some attention to his attire —only to consign his English clothes to an air tight tin box, and to acquire in their stead an outfit similar to that worn by his brother exiles.

A DRAWBACK.

Perhaps his chief drawback is that there is none of the light side of life for him. If he is in charge of a Calcutta mill he can go to the theatre or a music hall performance in the cold season, as the winter is called; races and steeple chases await him; concerts take place periodically and a band plays almost every night in the public gardens. But these amusements are of a more or less inferior nature and no matter how much the miller may appreciate them he is always confronted with the thought that he is temporarily cut off from the pleasant home life. Still a considerable percentage of English employees in Anglo-Indian mills are contented with their life there and would be very loth to give it up and return to England. Unconsciously they lead their acquaintances at home into imagining that India is a paradise on earth.

THE LONELY MANAGER.

It sometimes happens that the manager finds himself in charge of a mill which is the property of a syndicate of wealthy natives and that he is the only white man in the place. Under these circumstances he is more than lonely, for not only is a Mohammedan or a Hindoo impossible as a companion, owing to his having nothing in common with the Englishman, but the characteristics of the black man are such that the mill man does not, as a rule, care to cultivate his acquaintance. Occasionally a commercial traveler, working in the interests of whisky or cigars, or the representative of a firm of mill machinery makers, puts in an appearance and is welcomed by the miller, but he may have to go weeks without seeing another white face. Sometimes he prevails upon a girl of his own nationality and color to marry him; should he not be successful in persuading the object of his choice that life with him in some hateful place, miles from civilization, is infinitely preferable to anything else, he will solace himself with the daughter of indigenous half-caste parents. Alliances of this nature are the greatest possible mistakes, for though these well meaning women are worthy in many respects, it takes more than a champion stocking darner or an expert domestic economist to make a desirable wife for a white man. Another drawback to these mixed marriages is that the Eurasian lady is likely to exercise a bad influence on a spouse who becomes too easy going, owing to a variety of causes for which the detestable heat of India and the general slackness of its inhabitants is responsible. It would perhaps be as well to close with a word of advice: Stay at home, make a fortune if you can, but in any case stay at home.

TEXTILE FIBRES OF THE PHILIPPINES.

BY A LOOKER-ON.

The Moro system of assorting hemp fibre does not differ materially from the Filipino or Spanish mode on the Luzon, Panay or Negros islands. The fibre of the central layer, called the bandala, is the same kind here as elsewhere, and is the common fibre of commerce. The white, superior and exceedingly fine, brilliant portion, coming from the heart of the saja is called lupis, and is sold at prices above the regular kinds. This is the kind that is made into fabrics as a rule. The process of taking these hempen strands to market involves the putting up of the same in bundles called piliban. There is considerable money made by the Spanish, Chinese and other merchants of the towns and hamlets in this island by handling these bundles. The workmen from the plantations do not, as a rule, care to remain at the sea ports

long, and they sell the hempen stocks to the merchants at low values, while the merchants resell at advanced values to the next shippers that arrive in port. Civilians and prospectors in this portion of the country are doing quite a flourishing business handling hemp.

Although few of the producers of hemp in this island manufacture hemp fabrics, nearly all of them have their rope walks. I visited these rope walks and found that different schemes were employed on different plantations for imparting the needed twist to the strands of the ropes. One of the best I saw called for employment of five men, at points along the line of walk, which extended about

SPINNING AND DRAWING THE STRANDS.

one hundred yards. At the first end, a native turned a series of three pins by a native turned a series of three pins by means of an arrangement of cranks, each pin being horizontal and carrying a strand, which extended the length of the walk and received its share of twist. In the centre is another twisting combination, worked by two natives, who would lay the strands and guide the twist to make a full rope. At the finishing end are two natives imparting a final twist to the rope with a crank and turning disk.

The plantation owners and the workmen of this island are not without their troubles. There are high winds and earthquakes. I experienced one earthquake which seemed to cause the bamboo shops and huts to sway fully twelve inches to and fro, rocking in an alarming way. The earth cracked in several places. The natives did not appear to mind the shaking. They all laughed, but the severe winds scared them. I saw one tornado that overthrew several shacks on the plantation and scattered the hemp stocks and the devices in all directions. The tall cocoanut trees were bent to the earth and many broken off.

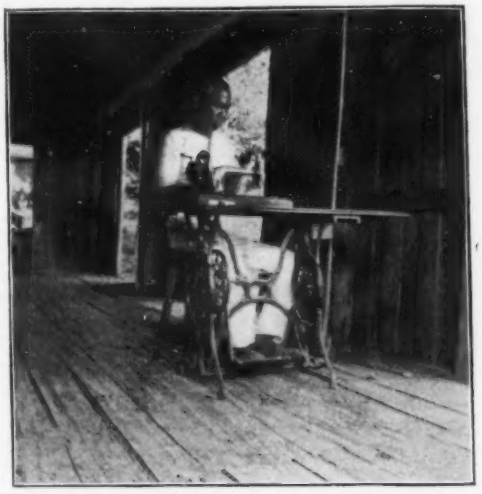
On several of the larger plantations of Mindanao the owners possess cattle and sheep, but the natives are not aware of the value of the wool. Strange to say, none of these Moro planters or hemp workers appear to utilize the wool of the sheep except for stuffing pillows. I saw sheep in abundance, but in every case the wool was used for pillow work. The wool is valued at only a cent or two per pound. The wool is all right for manufacturing purposes and possesses all the qualifications of wool grown in other countries for textile making.

The cloths for domestic use are of a coarse nature, with the colors chiefly of the fanatical lines, to meet the weird ideas of the Moros. The Moros delight in wearing flashy colors. I saw no sombre black garments or all white. All wraps and cloths for men and women of the Moro race have such colors as red, yellow, blue and the like. Most of the weaving is done on very crude little hand looms of the Queen Ann type. Harnesses are raised and depressed by foot power and shuttles thrown by hand.

Jusi from the fibre of the pineapple is probably the richest of the textures made and sold in Mindanao. Panay Island has the reputation for producing elaborate jusi goods, but the weavers of the other islands are equally as competent in selecting stock, making warps and designing artistic patterns. For years most of the patterns were necessarily in checks or plaids, as they had no means for weaving figures. There are now looms in Manila, Iloilo and elsewhere, also a few in Jolo, on which figure work is done; there are dobby head motions attached to the looms and operated by hand. The process of weaving is exceedingly slow, but as the workers at the looms receive only ten or fifteen cents per day, the proprietors make a good thing of it as it is.

Silk is likewise manufactured into cloth s here, but all this silk is from China. These

Chinamen in the commercial centres are deriving rich returns on their investments in silk, for they buy large lots at market values and peddle it out to the native weavers in



NATIVE TAILORS MAKING A JUSI SUIT.

very small quantities at greatly advanced prices. Cotton is also imported and used on the native looms. I saw cotton growing in some places, but the natives do not know how to cultivate it. Cotton grows wild on

PROSPECTING FOR TEXTILE FIBRE.

trees here in Mindanao, and no doubt this tree-cotton will be used some day.

There is a very excellent opportunity for the sale of large lots of medium priced part wool colored blankets among the Moros. Germany, Spain and China send a few wool blankets into the Moro country, but the prices are very much too high. There is a need of a three-dollar blanket, made pretty much as Indian blankets would be made for America. There are some three hundred thousand Moros hereabouts, and a very large percentage merely wrap a form of native cloth about their person. This cloth is not suitable, and ordinary single blankets, moderate weight, red, with blue or yellow mixed headings, would sell very rapidly here.

COST CALCULATION FOR WOOLEN GOODS.

BY ELMO.

The calculation of cost in the manufacture of woolen goods is a matter of the utmost importance, as it enables the manufacturer to figure safely upon the probable cost of any line of work, to place upon his goods a price that will insure profit and consequent stability to his business, and to meet his competitor in the market.

The want of a proper method or system in this matter has often resulted in loss and final bankruptcy. Though it is not possible to arrive always at absolutely correct conclusions, yet a careful system followed for a series of months or years will enable one to estimate closely enough to avoid disaster, and to know at all times the probable profits of his business, as well as to determine beforehand the advisability of undertaking the production of any line of goods. It enables him to know from the start, or before the start, whether any particular venture is likely to prove profitable.

It must be understood, however, that whatever the system, it contains some element of an estimate, especially where a variety of goods are made, yet the system we propose will lead to a very close estimate, and as nearly accurate as is possible.

It takes into account every item of expense covering a specified time, and by following out the system the estimate is always up to

date and in accord with any changes in equipment or running expenses that may occur. In figuring the cost of the stock, it must include not only that which the finished fabric contains, but that which is lost or goes to waste in its production, which is sure to vary with the different qualities of stock used.

As a rule, the lower the grade of stock the greater the percentage of waste, and the real allowance to be made can be determined only by a careful account and comparison of the yardage of cloth and stock prepared. After a little experience, a very close estimate may be made, so that the number of ounces or pounds of stock required per yard or piece of goods may be easily determined.

The practical designer or superintendent should know the amount of stock required to make a yard of each class of goods, as figured from the size of the yarn, the width in the loom, the number of picks and an estimate of the allowance to make for waste in the process of manufacture.

After determining the gross amount of stock required for a yard of any particular fabric, and the cost per pound of the mixture, it is not difficult to determine this part of the cost of the fabric, viz., the material used. But when it comes to the figuring of other expenses, including the "fixed charges," such as taxes, insurance, interest, fuel, oils, chemicals, soaps, etc., we are dealing with something that cannot be so directly and easily figured. Many of these items are of such a nature that it is quite impossible to apply them equitably to the different grades of goods, except by figuring an average cost of each item as applicable to one yard, pound or ounce of the finished cloth.

This may be done by an account made at the end of each year, or any regular period, put into a concise tabulated form, and another account showing the total production in yards and pounds of finished goods for the same period, and a careful figuring to determine what portion of each item or account should be applied to one yard, pound or ounce of cloth.

We give below an illustration of such accounts taken from actual results in a six set mill on a variety of work.

No. 1.—Year's Production.

Kind of Goods.	Yds.	Fin. Wt.	Pounds
6/4 Union Cass.	149,160	12.5 oz.	116,531
6/4 Cheviots	1,460	12.5 "	1,141
6/4 H. W. Cass.	22,345	22.5 "	31,423
6/4 Home-spun Dress Goods	25,592	9.6 "	15,355
6/4 Suitings	5,455	10. "	3,409
	204,012		167,859

No. 2.—Various Accounts for the Year.

	Cost	Per yd.	Per lb.	Per oz.
Wool	$54,486.92	$.26707	$.32459	$.02029
Shoddy	7,012.18	.03437	.04177	.00261
Cotton	10,158.94	.04979	.06052	.00378
		$.35123	$.42688	$.02668
Wages	$35,991.42	$.17641	$ 21441	$.01340
Commission and Charges	11,620.74	.05696	.06923	.00433
Interest	9,200.15	.04509	.05481	.00343
Expense	5,620.92	.02755	.03348	.00209
Chem. and Dye	5,402.18	.02648	.03218	.00201
Fuel	3,180.68	.01559	.01895	.00118
Soap	1,898.40	.00931	.01131	.00071
Insurance	1,216.32	.00596	.00724	.00045
Oil	960.18	.00471	.00572	.00036
Freight and Trucking	784.16	.00384	.00467	.00029
Electric	320.42	.00157	.00191	.00012
	$145,853.61	$.72470	$.88079	$.02837

Table No. 1 shows the different kinds of goods made during the year, together with the yardage, average weight per yard and pounds of finished cloth as figured on the basis of the average weight per yard.

Table No. 2 shows the expense for the year of each and all the different accounts, and what portion of each of these items should be applied to a yard, pound and ounce of the finished goods, carried to the third decimal figure. It will be seen that we have figured the total cost per ounce, showing the stock to be $0.02668 and the other accounts $0.02837, which combined cover the cost per ounce of both the manufacturing and the selling of the product of the mill.

We make these two figures of cost, because we have no use for the former, representing the cost of stock, in our calculations, while the latter enables us to arrive at results that we could not obtain in any other way, and to solve the problem of "fixed charges" and their proportionate application to the cost of a yard of cloth.

We do not use the figures in the table showing the cost of the stock, because it is far better to figure upon the actual cost of

each kind and grade of stock at the outset, as the mixtures are made up; for with a variety of goods and stock much better results can be secured than to depend upon average calculations. In fact, we resort to averages only when there is no other way to arrive at safe and reliable conclusions. Having the amount of material required per yard and the cost of each grade at the outset, we can at once figure correctly the cost of the stock without the need of resorting to an average calculation.

In calculating the cost by the use of table No. 2, the column showing the cost per ounce will be the most convenient and accurate. The average cost per yard, as shown in the first column, would not be so reliable where both heavy and light weight goods were made, as it represents the cost of an average weight, hence it could not serve for both 12-ounce and 24-ounce goods. But by using the average cost per ounce, the result would be proportionate to the weight, making the latter cost double the former, and being as nearly correct as can be figured from the yearly production shown.

It must be borne in mind, however, that while the cost of the stock is figured upon the gross amount used to make the goods, the manufacturing and selling are figured upon the finished product, as the table is made out on that basis.

The mill from which this record is procured always included the freight upon the stock in its cost. This gave the actual cost of the stock laid down and clean at the mill, and this part of the freight account for the mill does not appear in the freight item in table No. 2.

To illustrate the method of arriving at the cost of a particular fabric, we will figure upon a light weight cloth, composed of a mixture of 50 per cent. wool, 25 per cent. shoddy, and 25 per cent. cotton: the warp to be 3 1/2 runs, the filling 4 runs, and the goods to weigh 13 ounces when finished. We will reckon the wool at 50 cents per pound, and the shoddy and cotton at 16 and 15 cents respectively. We give the detail of the lay-out and cost as we would figure it for this fabric:

2800 ends 3½ run warp	
72 " " " for selvage	
2872 " " " warp total	= 8.20 oz.
5 per cent. take up in weaving	= .41 "
76 inches in reed, 40 picks 4 run filling	= 7.60 "
Weight from the loom	16.21 "
Allowing 25 per cent. for waste in process	= 5.40 "
Gross amount of stock for one yard	21.61 "

Mixture:

50 per cent. wool at 50 cents	= .25
25 " " shoddy " 16 "	= .04
25 " " cotton " 15 "	= .0375
Cost of mixture per pound	.3275

21.61 oz. stock at .3275 per pound	= .4423
13 oz. at .02837 (table No. 2)	= .3687
Total cost of manufacturing and selling	.8110

It will be seen by deducting this $0.8110 from the selling price of the goods you get the net profit per yard to the mill. If only the cost of the goods "at the mill" is required, the charges belonging to the selling end of the business can be left out of table No. 2.

Where a mill is making various grades of goods, requiring both fine and coarse yarns, as well as much double and twist work, it might be justly claimed that the average of wages would not be reliable, as the labor upon fine yarns and the time required in making them is so much more than upon the coarse work.

In such a case a variation in the method would be advisable, though it requires more care and figuring to carry it out. It is perhaps the best method, if one cares to take the trouble, but hardly worth the while if the mill is on a uniform class of work. It would be to leave out the item of wages from the No. 2 table, and institute a system of figuring the cost in wages for each department of the mill and each grade of work separately.

The mill could be divided into four or five departments, as

Preparing and carding,
Spinning,
Spooling and dressing,
Weaving,
Finishing,
Miscellaneous.

A separate account of cost of different grades of work in each of these departments would give very accurately the cost to be applied to each, and avoid the possibility of errors that an average calculation might pos-

sess, where one-and-two run and eight-and-ten run yarns were being made side by side.

The tabulation of the accounts as directed will be found valuable aside from the cost calculations, as a comparison from year to year will lead to a knowledge of the expenses, and often act as a stimulus to economy in the various departments.

Of course, it will be understood, that the take-up in weaving and the waste in process of manufacturing will vary with different weaves and grades of stock, and upon due allowances often depends the correctness of the calculations.

A Peculiar Textile Center.

In a recent report to Washington, a U. S. consul states that Crefeld is a very peculiar manufacturing town. It is not favored by natural advantages, nor is it, like many manufacturing towns, situated on a great railway. It lies on the left side of the Rhine, although several miles from it, and is fifteen miles northwest of Dusseldorf, with which it is connected by a light electric railroad running across a plain practically uninhabited.

Nevertheless, Crefeld is the Lyons of Germany, its great industry being the manufacture of silks and velvets. The textile industry of the place did not assert itself until the seventeenth century, when the manufacture of linen was developed. Silk was introduced in the latter half of the same century. Today mechanical power takes the place of the old hand looms, the number of the latter having been 6,551 in 1901, as against 10,268 power looms.

The best-known institution in Crefeld, which attracts pupils from all over the world, is the textile school. "Like all German educational institutions," says the report, "it does not try to cover too much ground—a mistake made by some technical schools both in England and America—but specializes in a well-defined direction. It aims at teaching the Crefeld industries, and it teaches them thoroughly; but it also takes account of new branches and helps to encourage them. It has been invaluable in maintaining the reputation and industrial efficiency of the town in the face of severe and increasing competition."

The report says that the curse of the place is the declining birth rate, characteristic of textile centres.

Thinking and Working.

The following is from the commencement address by Ira Remsen at Worcester Polytechnic Institute, June 9, 1904:

A child learns a great deal in regard to his surroundings in his earliest years before he goes to school and without the aid of his parents. He is constantly engaged in making observations and drawing conclusions, and his actions are largely guided by the knowledge thus gained. After a time school life begins, and the child then begins to study books and to acquire knowledge at second hand. This is an entirely different process from that by which he gained his first knowledge. The latter is natural; the former is artificial.

Then, too, he soon discovers that many things he sees call for explanation, and he is led to wonder what the explanation is. If he has a strong imagination, as most children have, he will probably think out some explanation. He finds that he can use his mind, and that this helps him in dealing with the facts in nature. Now comes the danger. It being much easier to think than to work, the chances are that in trying to find the explanation of things, he will give up the natural method and be satisfied with the products of his imagination. He will gradually give up dealing directly with things and take to thinking alone. When this stage is reached his knowledge will increase very slowly, if at all.

Whether this picture of the development of a child is in accordance with the facts of life or not, it gives an idea of the mental development of mankind. First came the period of infancy, during which observations were made and much was learned. Efforts were early made to explain the facts of nature. We have remnants of these explanations in old theories that have long ceased to be useful. They no doubt served a useful purpose in their day; but gradually one of the most pernicious ideas ever held by man took shape, and I am willing to characterize it as one of the most serious obstacles to the advance of knowledge. I refer to the idea that it is a sign of inferiority to work with the hands. This idea came early and stayed late. In fact, there are still on the earth a few who hold it. How did this prove an obstacle to the advance of knowledge? By preventing those who were best equipped from advancing knowledge. The learned men of the earth for a long period were thinkers—philosophers. They were not workers in nature's workshop. They tried to solve the great problems of nature by thinking about them. They did not experiment. That is to say, they did not go directly to nature and put questions to her. They speculated. They elaborated theories. During this period knowledge was not advanced rapidly. It could not be. For the only way along which advances could be made was closed. Slowly the lesson was learned that the only way by which we can gain knowledge of nature's secrets is by taking her into our confidence. Instead of contemplation in a study, we must have contact with the things of nature either out of doors or in the laboratory. Manual labor is necessary. Without it we may as well give up hope of acquiring knowledge of the truth. When this important fact was forced upon the attention of men, scientific progress began.

Eli Whitney received $50,000 from South Carolina for the free use of his cotton gin in that state.

By far the greater part of the world's supply of sulphur comes from Sicily, but some is obtained in Japan, Italy, Greece and the United States.

ENGLISH NOTES.

(By our Special Correspondent.)

With as nearly as possible no business doing the price of wool remains wonderfully firm. The statistical position explains the firmness in face of a miserable inquiry. Holidays are given as an excuse for bad trade at present. But the spending power of all classes, has been appreciably below the normal all the year, as cloth merchants and retailers can abundantly prove. Tightness prevailing all round, it is evident that nothing like a rush at high prices need be anticipated.

So far as domestic demand goes, wool prices are not justifiable and they are held at their level by men who feel that in the long run their ruling must be accepted. This artificiality creates some disturbance. For instance it makes shoddies and low materials dear and the high prices drive some manufacturers, here and upon the Continent, to subtitute still lower blends of rubbishy stock.

While most cotton spinners in Lancashire have stood loyally by their brothers, a considerable number have sought only their own profit. When short hours were observed by the members of the Federation certain mills were run to the fullest. To placate members who had grown restive under this harassing kind of competition the federated spinners sanctioned a working week of 47 1/2 hours. After a short experience the 40-hour basis has been resumed and the continued curtailment is expected to show good effects on the course of prices. Looms in most quarters are busy. In the Burnley district, the home of the trade in plains, 1,100 more looms are in action than ever before; 76,475 is the total. Blackburn runs 75,300 and Preston 40,000 on more expensive or elaborate cloths.

Here are some figures showing how money is made currently out of the patent finishing of cottons. At one works, where schreinering is carried on, 240,000 yards were treated in one month by the machines. The cost in wages was precisely $730, and the money earned was rather more than $5,000. Out of this handsome margin a small quantity of damaged goods had to be paid, also rent, power and depreciation. The rest was clear profit on a few sets of "bowls." From such bonanzas as these come the high dividends on inflated capital. It is only right to say that the example is believed to be an unbeaten record in economical management. Low wages and hard driving alone can thus make working-costs infinitesimal.

Textile Yorkshire is gasping over the details of the financial deal by which the combers of Bradford became the Yorkshire Woolcombers' Association. The combine itself is in the hands of liquidators and a suit has been brought against certain directors of the body for restitution of funds by a group of wealthy shareholders. That shameless spoliation had occurred was generally believed, but that human cupidity had gone so far as the evidence indicates, few had guessed. Here are specimen transactions: Hill's plant and building cost when new less than $320,000, and they were transferred at $1,285.000; Willey's plant and buildings cost $340,000, and they changed hands at $1,375,000; Musgrave's combs were bought second-hand at $3,500 each, and in five months were delivered over to the Association at $22,500 each. Nine million dollars were shared out by the vendor-directors among themselves for business acquired. Some had hardly commenced, some had lost money for years, all had agreed to use fictitious prices for combing in making up the balance-sheets, and some who ran only by day received goodwill as though they had run day and night. A compact was made between these beneficiaries that no director should know at what price his fellow's business was bought in.

Who wonders that the rotten edifices collapsed? It is surprising that even the debenture holders can sell their bonds for only 35 per cent. of face value. As for preferred ordinary shares some gamblers are buying odd lots at four for a shilling, eighty to the pound. For all this ruin and disaster the top-making vendors are chiefly to be blamed. To some small commission combers the wreck has brought nothing but loss. Some who stayed outside of the combination have run double-shifts ever since its foundation and have put together useful little piles of profit.

To save their bacon the vendors to the English Sewing Cotton Co. are easing the

burden upon the concern. Ermen & Roby, as an act of grace, repay $50,000 in stock and shares; Strutts, of Belper, promise something; Arkwright's buy back two unused mills; and Dewhurst's of Skipton, re-purchase one of the properties they sold to this storm-tossed trust. With these adjustments it is supposed that a brighter future for the combine is in store. Khaki for the army and navy has come nigh-to-killing another combination, the Yorkshire Indigo Dyers' Association. As its name denotes it flourishes on the use of blue.

A standard shade-card has been a fond ideal for a quarter of a century. At length the Bradford Dyeing Association, which virtually monopolizes the dyed dress goods trade, has acceded to the demand. It is anticipated that much needless pattern-sending will be obviated and that a practicable code of color language will follow. The old discrepancies between pattern and piece may remain, for to codify a color is not to reproduce it accurately, but merchants look for some advantages to spring from the innovation.

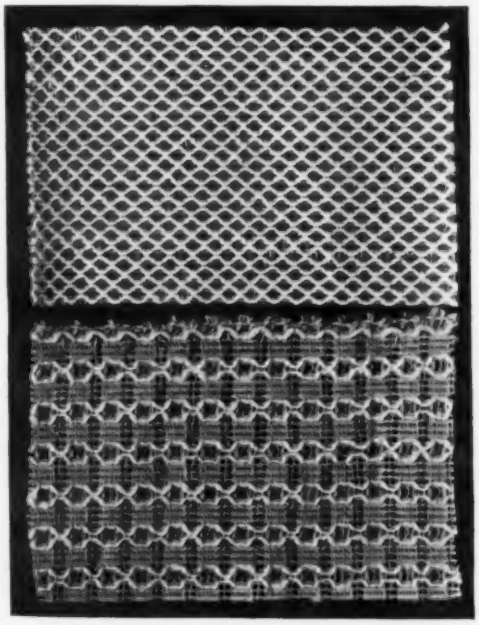
Mazamet wools count for a good deal in Yorkshire trade. Statistics indicate that somewhat less was shipped hither last year than usual, for which bad trade may be accountable. Canada figures as a customer for the short carded sorts, in which respect she copies the Scotch example. From official figures it appears that some 18,000 tons of Mazamet material changed hands at the source of origin, valued roughly at $13,000,000.

Millionaires in America may find the example of the Clothworkers' Company, of London, suggestive. This body is a relic of mediævalism, a survival of the old craftsmen's guilds. It is a dining and a wining company of great wealth obtained from the enormous appreciation of real estate values in London during the centuries. Its surplus funds are devoted largely to textile education. Some $400,000 have been contributed in the past to the Yorkshire College. Now that the technical college becomes Leeds University the Clothworkers endow the textile department with $20,000 per annum in perpetuity. No technical college or school in the clothing districts has failed to share in these benefactions.

MONTHLY REVIEW OF THE FRENCH MARKET.

BY LE PARISIEN.

The exportation of mixed cotton and wool goods, such as the knotted effects which have recently been so popular, appears to be slackening somewhat. There has been considerable inquiry for solid colors, but the trade in this line has not yet developed to



large proportions. On the other hand there has been much sampling of the vigoureux mixtures in new shades, including small checks. Bourettes disappear slowly. The latest styles made are in very bright shades, blue, green, red and white on dark grounds. For summer goods for which the season has just closed, voiles have been much in vogue even in self colors. The voile etamines with coarse ridgy threads requiring a silk back ground in gaudy colors are not being made. Very light voiles in light shades are still in request for the summer of 1905. This is in conformity with the present trend away from

stiff rigid fabrics and toward soft fluffy cloths.

Stripes are still popular although somewhat on the decline and very effective stripe effects are being made in voile fabrics. For fancy goods very soft satin fabrics are in demand, showing small neat effects, polka dots, small irregular spots and sometimes shaded stripes all in new and very attractive effects. Over plaids are prominent in the fancy voile effects. Scotch plaids are also found with stripes and fancy patterns showing bright colors on neutral grounds. Voiles with embroidered patterns are also in demand and very attractive effects in this line are found in the latest Parisian novelties. Embroidered effects have been made at Roubaix on the Swiss and Heilmann machines. The motives are very small but are of many varieties including the crepeline, of which several kinds are made on mousselines, open work voiles, serges and wide diagonals. There is a small demand for chemisette fabrics. During the last year these have been made in voile and mousseline de soie, Fig. 1, also in lawns.

The present may be called a period of transition in the textile trade. There are some good ideas in the new fabrics, but a predominant feature which is likely to endure for several years has not yet developed.

COLORED COCOONS.

Some time ago we referred to the experiments by Comte and Levrat of Lyons, France, to obtain silk cocoons of different colors by feeding the worms colored food. The subject attracted so much attention that the U. S. consul at Lyons, John C. Covert, interviewed Messrs. Comte and Levrat and obtained a statement from them which he embodied in a recent report to the Department at Washington.

It is not expected that any commercial advantages will be gained or any discoveries made that will cause any changes in the industry of dyeing.

The gentlemen are engaged merely in laboratory experiments in a field which has been partially worked for the last sixty years. The object of their studies was to discover, if possible, why some breeds of silkworms produce white silk, while others produce yellow or a yellowish-green silk. Their experiments showed them that the natural coloring matter of the cocoons was identical with the coloring matter found in the leaves. It was therefore logical to believe that the color of the silk must originate in the chlorophyl of the leaves fed to the worms.

The experiments which followed, undertaken to test this hypothesis, prove that a coloring matter introduced into the intestines of a worm by means of food may, under certain conditions, reach the silk through the blood.

Thirty silkworms, hatched June 16, 1902, were divided into a number of lots and reared on small branches. One lot was fed on leaves dipped in liquid to color them.

Some of the leaves the worms fed upon were colored a slight red and the worms ate them as they eat ordinary leaves in a natural condition. They grew and developed as if fed on common mulberry leaves. The general color of their bodies became a dark red and the blood extracted from them was of an intense red.

When the cocoons were formed, August 12, a pink silk was reeled from them. The entire cocoon was of a beautiful red. To prevent the silk from being soiled by contact with the coloring matter on the leaves or by the skin of the worms, which might have been spotted by the dye, some of the worms were washed and placed on freshly gathered branches where they at once began to form cocoons as red as the first lot.

Two worms that had been eating colored leaves were separated from the others at the fourth moulting (July 27) and fed for the rest of their lives on uncolored leaves. Little by little they lost the color received from the other leaves, and the silk reeled from them had only the slightest tinge of rose. In the excrement of these worms considerable quantities of red were found during the first two or three days, the quantity diminishing daily to the end of the larval period (August 14). The coloring matter contained in the blood passed into the intestines, and the red was completely eliminated in eighteen days.

The worms selected from the lot at the fourth moulting (July 23) were fed on colored leaves only during the fifth period of life, and they rendered, on August 10, cocoons as red as those of the first lot, in which the worms had been fed on colored leaves during the entire larval period. The absorption of red during the last period is therefore necessary and sufficient to color the silk.

A fourth lot was composed of worms fed on methylene blue. They ate this with less avidity; and a number, in their efforts to escape this food, fell from the branches and were lost. They formed their cocoons slowly and rendered but little silk, which was of a slightly bluish color.

Another lot of worms, the Atticus orizaba (this is a wild worm which does not eat mulberry leaves), were fed on leaves of the troene, a tree of the olive family (Ligustrum sp.) These leaves were dipped in a solution of picric acid. The well-known toxic qualities of that coloring matter did not prevent it from being eaten, but the worms did not relish it keenly and made no cocoons until September 4. Notwithstanding the coloring power of picric acid the silk remained white.

Thus we see that the neutral red passes easily by osmosis through the tissues, while methylene blue passes with difficulty, and picric acid leaves no trace of color.

The varying results of the different experiments are due to the different coloring matter tried. The well-known properties of the neutral red and the methylene blue in coloring tissues marked them for experiments of this kind. As to the picric acid its absorption by the worms seemed to be so strange that the workers were led to carry on their experiments to the end. In order to give a careful answer to particular inquirers, inspired by the belief that the thread was possibly soiled by contact with the coloring matter, a subcutaneous injection was made, in the worms ready to form their cocoons, in the false feet so as not to injure any organ. These worms immediately became red without appearing to suffer in the least. They produced a slightly reddish silk.

The experiments demonstrate that the injection of coloring matter into and through the sericigene gland is less easy with the bombyx (black bombyx is a domestic worm that feeds on the mulberry) than with the Atticus orizaba.

From the investigations and experiments made, it is inferred that a coloring matter may be passed from the digestive tube through the blood upon the silk. The coloring matter possesses in a different degree the power to cross by osmosis the tissues of silk worms and each race of silk worms is characterized by the osmotic power of its tissues in relation to different coloring matters, permitting the passage of some to the exclusion of others. This explains the natural coloring of the Lepidoptera.

CLOTH ANALYSIS.

BY J. H.

When analyzing cloth it is not sufficient merely to arrive at the ends and picks per inch; or ends in the warp necessary for any desired width and the size of the warp and filling. That certainly would be an analysis of the barest character and such an analysis may lead to trouble and expense. A manufacturer who goes in for the fancy trade receives inquiries of every description of cloth, and it behooves him to be very careful in the analysis and in the construction of new fabrics, and to do this correctly the cloth must be correctly analyzed. Frequently the sample submitted is not for duplication, but as a guide for the new fabric, certain changes being specified. It is necessary to find out as much as possible about the sample cloth in order to manufacture the material desired. It follows very often that an order depends upon the accurate estimate of the construction of the sample. If the estimate is too high then the price is likely to be too high and the order passes into other hands. If the estimate is too low and the order thereby obtained, the result may be a return of the goods as inferior or an allowance made, the whole transaction ending in loss to the manufacturer.

The importance of an accurate estimate of any cloth intended to be duplicated will be easily understood. There are other factors

which must be taken into account, factors over which a mill analyst has no control, such as the expenses and profits incident to its manufacture. These items do not come within the province of the mill analysis. The way of dealing with this matter is rather different in this country than in England, for in most cases in England the system of calculating the cost is more uniform than in this country.

A piece of cloth may seem of little significance, yet if it could speak it would unfold a tale of deep interest. Think of the many processes it has passed through since its fibres were gathered from the cotton field. Each process is important and the analyst must take account of them in the analysis of the many fabrics which are submitted to him from time to time. To the ordinary observer a piece of cloth is merely composed of threads of a required thickness intertwined at right angles to each other by the simplest form of weaving. The merchant, however, finds it necessary to make the simplest cloth in various ways, each possessing phases peculiar to themselves. For instance, a plain cloth is to be duplicated in a width of 39 inches at the loom, or, as we say, in the gray. The sample has been bleached. The first thing to do is to decide upon the amount of shrinkage which has taken place from the gray to the finished state. This varies considerably according to the weave and construction of the cloth, but in this instance it is estimated at two inches. The finished width is, therefore, 37 inches. The threads per inch in both warp and filling are then counted and allowance made for the stretch which takes place during the finishing process. The filling is twisted to the left instead of to the right, and a cloth made in this way can be duplicated only by using filling twisted in the same dircetion. This is a point which should be watched carefully. I have known cases of trouble under this head, and the merchant in England often stipulates in his order the particular direction of twist he requires in the filling.

The next thing to do is to size the warp and filling threads. The results of the analysis of this fabric are as follows: Bleached, 37 inches wide; grey, 39 inches; 76 threads per inch in warp; 72 threads per inch in filling; 50's warp; 52's filling, left hand twist.

Take for illustration another fabric. This cloth is a fine fabric, mercerized in the piece and is required to be 48 inches wide at the loom. The shrinkage in finishing is estimated at 2 1/2 inches; the finished width is 45 1/2 inches. The warp threads and filling per inch are next counted and the size of each is estimated. This would complete the details of this cloth were it not that the warp threads run in twos, that is, the cloth is reedy or without cover. The two ends in each split or dent of the reed must be worked as close together as possible. I have known this peculiarity to result in a better price than was obtained from the same cloth made in the ordinary way. The results of this analysis are as follows: 45 1/2 inches wide finished; 48 inches wide in the loom; 94 warp threads per inch; 94 picks per inch; 80's warp; 110's filling; must be woven reedy or without cover.

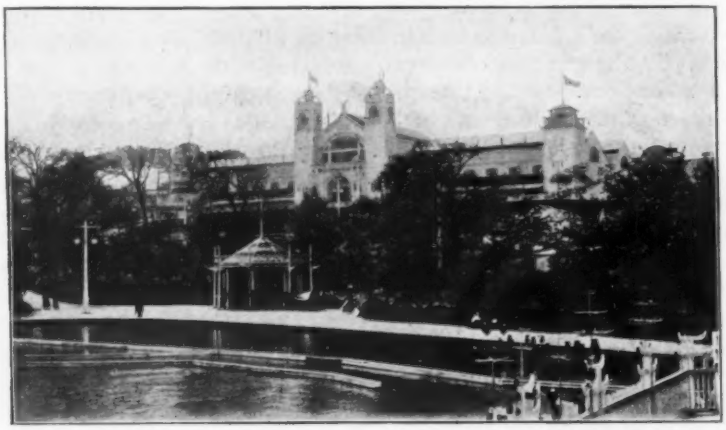
For the third illustration a crepe cloth is selected. It has been dyed pink in the piece. The cloth is rather coarse and rough in appearance, although uniformly so, and is very elastic. The shrinkage, size of yarn and number of threads per inch are determined as already explained. The filling threads are twisted unusually hard and this is the cause of the unusual shrinkage and elasticity. Half the filling is twisted to the right and half to the left. Two picks of one kind alternate with two picks of the other. This arrangement is for the purpose of obtaining a smooth surface by having the filling contract in opposite directions, thus preventing ridges which would result from using but one kind of hard twisted filling. Failures in making this cloth have been due to neglect of this point. The results of the analysis of this cloth are as follows: 30 inches wide finished; 38 inches wide in the loom; 80 warp threads per inch finished; 60 picks per inch; 40's warp; 24's hard twisted filling, right and left hand twist.

In the absence of any apparatus for the purpose, the size of the yarn is estimated by taking ten or any other convenient number of threads from the cloth and linking them with the same number of threads of known size. When testing in this way it is important to keep the threads straight before they are linked.

TEXTILE EXHIBITS AT THE BRADFORD EXHIBITION.

BY DAVID PATERSON, F. C. S.

The history of this exhibition is interesting. In 1898, Lord Mashem, perhaps better known to the textile industry as Wm. Lister, offered to the city of Bradford the sum of $225,000, subsequently increased to $287,500, for the erection of an art gallary and museum to serve as a memorial to Dr. Edmund Cartwright, upon whose great inventions of the power loom and the wool combing machine mainly depend the staple industries of the city. This liberal gift was gladly accepted by the corporation and to emphasize in a fitting manner the inauguration of such a magnificent gift it was decided to hold an exhibition in the beautiful park surrounding the Cartwright Memorial Hall. This hall stands on the site of Lord Mashem's old home in Lister Park.



INDUSTRIAL HALL, BRADFORD EXHIBITION.

The first exhibit that greets the eye is that of Lister & Co., Ltd., where there is displayed a beautiful collection of dress fabrics made specially for Messrs. Liberty & Co., after their own designs and colorings.

Priestley's Limited of Bradford have a similar case showing their silk and wool dress goods made into costumes, all vying with each other in style, taste and beauty of color.

Sir Titus Salt, Bart & Sons, of Saltaire, show some splendid examples of dresses made with their mohair, and John Foster & Son, Limited, an old established firm dating from 1819, and one of the largest manufacturers, give some seventeen exhibits of alpaca and mohair dress goods made into all kinds of exquisite and fashionable costumes.

Messrs. Mitchell Bros. have a very interesting exhibit showing all the different stages in the processes of making mohair yarns. Starting from the little Angora kid and the full grown mohair goat, the washed, dyed, spun and woven yarns are all shown in different stages of their manufacture; besides a valuable collection of all grades of weights and sizes of yarns.

The mercerized goods show up beautifully and the "Marquise" and "Radium" finishes exhibited by The Bradford Dyer's Assoc., Ltd., are difficult to tell from silk goods. The exquisite lustre on some of these dyed mercerized cottons is a revelation to textile workers.

There is a fine exhibit by Foster & Co., of Selby, of what can be done with the ramie fibre or China grass. In ramie we have a fibre of great value, but the difficulties of treating it are also very great. Many ramies put upon the market have been inferior and this has tended to prejudice the trade to a certain extent. This ramie fibre, however, seems to be prepared by a special, secret process by Foster & Co., whereby many of the difficulties in handling it have been overcome.

Wool Sorting and Separators. Messrs.

Matthews & Yates, of Manchester & Leeds, pioneers in mechanical ventilation, show several of their Cyclone fans and separators at work. For all workers where sawdust, fluff, or refuse of any kind is produced, these separators are of immense value.

In this exhibit they are specially adapted for wool sorters, where the caddis, fluff dust and all wool refuse is rapidly sucked through a screen or sieve and carried away and deposited into a dust chamber, where it can be used as fuel for steam generating purposes, or put to whatever use most desirable. The attendant placed on the screen a large handful or two of waste wool caddis and sweepings full of dust, which, under ordinary circumstances, would have filled a room with dust, but, under the strong suction of air under the screen (a draught of 1,200 feet per minute) the material was thoroughly cleaned in a few seconds and all the dust was seen passing into an adjoining chamber.

Such an apparatus must undoubtedly prove a boon to wool sorters.

Improved Warping and Beaming Machine. An interesting exhibit showing improvements in these machines is shown by J. W. Knowles & Co., of Bradford, in their patent sectional warping and beaming machine. The improvements in taking in the lease obviate the necessity of collecting the ends in the hand; thus preventing the ends becoming slack, entangled or broken at the back of the leasing slay; while the lease is taken much easier and quicker by means of a vertical parallel motion attached to the slay.

The section builder of this machine can easily and accurately be adjusted so that every section is properly and evenly built on the swift, thus avoiding ridges and grooved places between the sections, thereby ensuring a level beam when the warp is beamed off.

An important arrangement is that for driving the swift in order that its speed may be easily adjusted to suit the state of the bobbins and the quality of the yarns in hand. When the machine begins to run, the swift begins to revolve slowly at first, its speed gradually but quickly increasing until the full speed is attained.

This is found of great advantage in warping fine counts and tender yarns, as by preventing a sharp, sudden start of the swifts, much time and trouble are saved by having no broken ends.

The disadvantage of constantly adjusting the beam to the warp has been avoided by their improved method of connecting and combining the mechanism which operates the section builder with that which operates the traverse of the beam when beaming off. These are a few of the advantages claimed for this machine.

Bobbins and Self Threading Shuttles. The newest ideas in this line are shown by Messrs. Wilson & Co., Barnsley, Limited, Barnsley, by the display of a large and varied collection of bobbins for all varieties of textile work. Modern ring spinning is continually calling for more accurate and true running bobbins, as well as bobbins which can stand the wear and tear of conditioning. These requirements are said to be fully met by their enameled bobbins, which, after severe tests, have proved most reliable and satisfactory. In the manufacture of shuttles from foreign hard woods, it is of utmost importance that only good, sound, well seasoned blocks be used. This firm holds some 720,000 blocks of persimmon, Spanish oak, boxwood and cornel which is in itself a good guarantee of a good shuttle. They show an ingenious device in their patent "Lockfast" and "Climax" shields or caps, for securing the shuttle tip and also a variety of self-threading shuttles in different designs and patterns. These shuttles, from the exhibition of their working made before the writer, must give great facility to the weaver in renewing the cops and bobbins in the shuttle besides minimizing the amount of waste material. These shuttles entirely dispense with the disagreeable practice of drawing the weft through the eye by means of a sharp suction of the breath—a practice which has proved injurious to the health of the weaver.

Nothing could have been more beautifully simple and smart than the way in which the girl attendant threaded these shuttles. This firm also utilize every scrap of waste material in the manufacture of their goods and have a

chemical works for transforming the scrap wood and metal parings into useful products such as different kinds of charcoals, vinegar, copperas, red liquor, naphtha, etc., etc. Speed & Stevenson, 170 Summer St., Boston, are their American agents.

Geo. Hattersley & Sons, Ltd., of Keighley, exhibit their latest and perhaps the most important advance in power loom weaving consisting of the automatic self-shuttling loom, known as the Hattersley loom.

The Hattersley loom is adapted for making all classes of goods which require only one kind of weft in their construction. This loom is already at work producing muslins, calicoes, cashmeres, Italians, figured dress goods, both dobby and jacquard, jute sackings and worsted coatings. A weft indicator or a feeler motion ensures absolutely perfect goods, as far as weft is concerned, to be woven in this automatic loom. There are many interesting features in regard to this loom, only a few of which we may describe:

The speed of the loom is quite independent of the speed of the re-shuttling mechanism, while the ample latitude on either side of true positions of re-shuttling movements, require no delicate adjustments.

Greater production is claimed for this loom. An average number of weft spools used per day of 10 hours is 120 and as each change takes but 2 1/4 seconds, the time spent in re-shuttling is less than 5 minutes per day. The makers claim that there are fewer parts in this loom than in any ordinary loom, and that it can be made either underpick or overpick, fast or loose reed, with any description of treading motion and can be used as an ordinary one shuttle loom if desired. In this exhibit are shown three large and beautifully colored tapestry panels in imitation of the famous Gobelin tapestries, all woven on looms made by this firm of Hattersley, who have made a specialty of this class of machinery.

The large panels, measuring some 9 feet by 6 feet, were woven at the rate of 90 picks per minute.

The Ideal Lancashire Loom, as they call it, is exhibited by Messrs. Robert Pickles, Ltd., of Burnley, Lancashire. The following are the patents which, when applied to the ordinary plain loom, transform it into the ideal Lancashire loom.

(1) The Tandemite weft fork, which is considered the perfection of weft forks. The front, or prong portion having only to perform the delicate task of feeling for the weft, while the back portion or hook discharges the more laborious duty of stopping the loom. (2) The glove attachment, which prevents the strand of yarn from being cut or chafed against the fork-grate, so that the very finest yarns can be woven with freedom. (3) The flexible fork-grate, another valuable improvement. (4) The lignum-vitae slay, this wood having been found by experiment to give the very best results. It will neither warp, dry, nor swell and is largely self lubricating, from a natural oily matter it contains, which is said to be conducive to good weaving. (5) Flexible reeds. (6) Patent compressed shuttles. (7) Improved loom brake. (8) A patent actuation of the healds. (9) A finger rod and holding catch arrangement which prevents breakages.

It is said that one-half the breakages in warp and weft can be saved by adopting the above improvements. This loom was running at 250 picks per minute.

The Scottish Home Industries Association have an interesting exhibit showing their genuine hand-made goods, consisting of dress materials, Harris tweeds, shawls, hosiery, flannels, etc. There you see the hand loom, with its shuttle thrown from side to side by hand. There, too, you see the Highland lassie nimbly spinning yarns with the hand spinning wheel, and it is remarkable how cleverly these girls can spin. The yarns are strong and even in the twist and spun out of the wool while in a sliver state. The making of the genuine Harris tweeds is shown in the weaving with the hand loom, with its old fashioned movements of the hands and feet of the weaver. The shuttle is manipulated with a hand strap.

How strange it appears to look at this old hand method of manufacture, after coming from some of the latest, highly improved 250-picks-a-minute looms such as we have just described. How quaint and old these hand methods are. But the objects of this very praiseworthy association were fully de-

scribed by us in the February issue of this journal.

What is of great interest to the dyer and colorist in this department are the many differently colored wools all dyed with the natural dyestuffs of the Highlands. Here, for example, is a bundle of yarn of a soft moss green color dyed with the fern. Here again is a beautiful shade of old gold or dull yellow obtained from the heather of their Highland hills. There, too, is a beautifully deep and rich shade of seal brown got from a species of lichen named crotal, growing on the trees and rocks. Many other examples might be given.

The chemistry of the various dyestuffs is well represented by Messrs. Read, Holliday & Sons, Huddersfield, who exhibit a beautiful case, giving a selection of the dye products made from aniline, naphthalene, the sulphide colors, the substantive and chrome dyes in all the different stages of their manufacture, with dyed specimens showing the application of these colors to the different fibres. The wide range of colors and their beauty impress the beholder.

The Canadian Fur Company of Montreal has a very fine show in the exhibition. Although not composed of textiles, it at once arrests the attention of the visitor by the variety and richness of the collection of furs and valuable skins. Expensive sables, black, silver, blue and red foxes, leopards and tigers, magnificent chinchillas, minks, wolf, bear and sealskins in the richest profusion.

The automatic multi-color loom of The Anderston Foundry Co., Glasgow, is of interest to those engaged in textiles. This loom is fitted with all the latest textile appliances, warp stop motion, which can be adjusted to any loom irrespective of the weight or count of the warp. It weaves two or more shots in the shed and weaves box or basket combinations where two or more ends are in the same shed of uniform or varied colors.

The knot breaker or preparer machine, shown by P. & G. Garnett, Limited, of Cleckheaton, is specially designed with the object of breaking all kinds of knots and hard lumps of waste before it is fed into the garnett waste opening machine. By this means, the waste is rendered so soft that it can be easily spread out on the feed table, all nails, pieces of wire, and other hard foreign substances are removed and therefore the fine coating of the garnett machine is less liable to get damaged. This machine is useful for opening out old bagging, ropes and such like, hard twisted woolen, worsted or silk thread wastes.

One of the most important exhibits is that of the City of Bradford Technical College. This consists of several large cases showing the work of the students of the college in the textile, chemical, dyeing, civil, mechanical and electrical engineering departments, and of the various branches of art. In the textile department are shown all the dress fabrics designed by the students, also the books illustrating the students' work in combing, spinning, loom mounting, elementary and advanced color studies, etc. Examples from the testing laboratory illustrating researches conducted for the textile trade. In the department for chemistry and dyeing are shown the samples as dyed by the students themselves, also the natural and artificial dyestuffs and the colors produced by electrochemical action. There are also beautiful framed dye patterns showing primary, secondary and tertiary colors, and the effects of their combinations—all dyed on wool. What is of very special interest to the dyer is a collection of mode, or tertiary shades which are liable to change their appearance under artificial light. It is well known to all dyers that some shades are very sensitive to any gas or lamp light—becoming quite different in appearance. This collection is shown with the object of illustrating the splendid color-matching properties of the Dufton-Gardner lamp—the "Dalite." We have examined most carefully nearly all of the so called color-matching lamps, which profess to show to the dyer and the colorist the absolutely daylight appearance of their shade; and without exception, there is none, absolutely none, to compare with this lamp. In order to test its properties we had several very sensitive and easily changed shades in our pocket, and found them to present, under this Dufton-Gardner lamp, as near their daylight aspect

as could be desired. No other artificial light could show the same, the nearest approach to it being the magnesium light.

In this exhibit are also shown all the apparatus for experimental dyeing as used at the college and the chemical apparatus for fitting up a complete color testing laboratory.

Before concluding this brief sketch of the objects of most interest to our readers, we wish to express our indebtedness to Mr. P. J. Hogben, representative to the whole of the textile section, who kindly conducted us to objects of special interest, and opened several cases for our closer inspection.

Chinese Cotton Mills.

A glimpse of the "yellow peril" is afforded in a recent book written by E. F. G. Hatch, a member of the British Parliament, who recently made a tour through Asia and studied the Asiatic at home. He found that, contrary to the principles of perspection, the yellow peril grows smaller the closer the observer approaches it.

Americans think of eight hundred million Asiatic at the opposite side of the earth willing to work hard for three to ten cents per day, and conclude at once that the ruin of American and European industries will quickly follow the introduction of modern methods and organization into Asia. They lose sight, however, of the question of quality; of the fact that cheap labor is seldom efficient; and that when an employer gets a man, woman or child to work for five cents per day he gets no more than he pays for. Mr. Hatch thus describes the conditions in Chinese cotton mills:

The industrial side of Pekin in the sense in which we understand the term is of small account, for what few manufactures exist are of an insignificant kind, and associated almost entirely with the supply of the domestic needs of the population. Later on in my tour, however, I had an opportunity of seeing the Chinaman working under Western conditions, and with Western appliances. The occasion to which I refer was a visit to a cotton mill at Wuchang on the Yangtse. It was a splendidly equipped establishment, with the most modern machinery, supplied by Messrs. Brooks, Doxey & Co., of Gorton, Manchester. It was with much interest that I looked forward to my inspection of this mill. Here, if anywhere, I thought I should have an opportunity of seeing the growth of the industrial Yellow Peril with which we have been so often threatened by political and commercial alarmists. Here I should see in active operation the movement which, according to these individuals, is to wipe out eventually the Lancashire trade. I must say the result was far from supporting these exaggerated apprehensions. On all hands I found evidences of the ineradicable difference there is between a British and an Asiatic industry, though the two may be outwardly conducted on the same lines. The work proceeded in a listless, half-hearted way, as if the object were to keep the production at the lowest possible level. There seemed no effective supervision, and the machinery was badly tended. Seeing what I did, I was not surprised to learn that the mills did not pay. It would have been remarkable if they had done so under such a slip-shod system. Some little time before I visited the place an Englishman had been employed as manager; but he got himself disliked by pointing out robberies which took place, and was sent away. Honesty of the British pattern is at a discount in China. It seems to be a custom amongst Chinese employees to regard their wages as a kind of retaining fee, and, according to their code of morality, it is quite justifiable to supplement it by any means, either honest or dishonest.

The mills at Wuchang are on a very extensive scale. There are fifty thousand spindles, and four thousand workpeople are employed. I made inquiries as to the wages paid and conditions of labor, and as the details given me are of some interest as bearing on the question of the industrial future of China, I reproduce them. The wages, I was informed, were as follows:

Chief engineer	$45 per month
Second engineer	$20 per month
Machinists	$7.50 to $20 per month
Boys	3 to 6 cents per day
Coolies or unskilled laborers	5 cents per day

The employees work two shifts per day of eleven hours each, one hour in each shift being used for chow, i. e., dinner. These mills, I may add, are run by the Viceroy of the Province.

The extraordinary cheapness of labor which is revealed here is fairly typical of the whole of the Europeanized industries of China. On the railways the scale of payment is somewhat higher. For example, the following were given me as the average wages paid on the Northern Railway:

Stationmaster	$25 per month
First-class Cantonese drivers	30 per month

Northern Chinese drivers
..... $12.50 to $25 per month
Railway guards ..... $4 to $8 per month
Ticket collectors ..... $3 to $4 per month
Coolies' wages ..... $2.25 per month

These are wages which would seem to make possible the most ruinous competition with the commercial enterprises of the West. Yet for the reasons I have indicated above I do not think that British trade, at all events, has much to fear from Chinese industries. Whereas in the case of the railways and the cotton mills at Shanghai, there is sound honest European management, the advantages of native labor can be reaped; but in manufacturing firms in which this factor is eliminated the cost of production is sure to be so greatly enhanced by the corruption and dishonesty which are engrained in the native character as to reduce the benefits of cheap labor to the vanishing point. I do not say that a time may not come when Chinese industry will be organized from without; probably some such movement will be witnessed before the world is much older, and on a large scale, too. But even if this is done, it is not likely that the founders of the manufacturing concerns will be able to do more than minimize the evils which I have indicated. The superior moral qualities of the Western workman will tell not less powerfully than his greater skill and adaptability, and, as in India, where he still holds his own in spite of native competition, he will continue to have a large share of the trade.

WHY TEXTILE GOODS SHOULD BE ADVERTISED.

VII.

This is the seventh of a series of papers upon textile advertising by Thomas Balmer, advertising manager of the three publications of the Butterick Publishing Company—The Delineator, The Designer and the New Idea.

1. Necessity and possibilities of textile advertising.
2. Naming and trade-marking textile goods.
3. Planning the advertising campaign.
4. General publicity and work upon dealers.
5. Actual experience of manufacturers whose advertising has been successful.
6. Brief comment upon six different lines which will then be discussed, one at time, in the six following papers based upon actual statistics collected at an expense of thousands of dollars and an equal value for the time demanded for their collection.

The first six papers of this series have dealt with generalities—not glittering generalities which suggest emptiness, but solid generalities which are true, even though they are general.

Now I am going to make some of these generalities specific. I am going to give actual statistics showing, not why textiles should advertise so much as why cotton textiles should advertise, and not why cotton textiles should advertise so much as why fruit of the loom should advertise.

I am going to take you, Mr. Cotton Manufacturer, into the big retail stores of the country. I am going to show you exactly what conditions exist. I am going to prove to you, with evidence that cannot be contradicted, just how many times your particular goods are called for, and how many times they are sold on such calls. I am going to present to you the American woman, the shopper, the housewife with her multifarious needs of cotton goods of all kinds, utterly astray when it comes to buying, because no cotton manufacturer has identified his goods, explained the purposes for which they are adapted, and given the shopper a handle in the shape of a name by which to ask for them.

Some of these shoppers asked for goods by name, but often they asked for goods by name for a purpose for which these goods were not adapted. Most of the times they asked for goods to be used for a certain purpose, and took the word of the salesgirl as to the best goods for that purpose.

It is only because the salesgirls were reasonably intelligent that most of these women were satisfied. Wherever the salesgirl or the store behind her is prejudiced, as, for instance, having one particular line that it prefers to push or that it manufactures itself, your goods, unless they happen to be the fortunate goods, will be discriminated against.

I took ten department stores in Chicago and ten department stores in New York. I made a classified table, using the first ten customers at the cotton goods department in each of these twenty stores. The first ten shoppers would establish a fair average, which would not be true if they had been picked out during the day.

Just what these women asked for in the way of cotton goods, for just what purpose they wanted the goods, just why they wanted these particular goods, just what they were

offered, and just why they were offered a substitute, and whether or not they bought and why, are shown in the case of each shopper in each store. The net result of these investigations are the tables which follow.

There are shown most of the leading brands of cotton goods. These tables fairly represent the situation in all stores of all sizes the country over. They prove beyond the shadow of a doubt that the cotton manufacturers are suffering from lack of knowledge on the part of the real users of their goods—the consumers. All the knowledge about their goods is in the hands of the salesgirls. The success of their products is dependent upon the intelligence of these girls.

The housewife who uses the goods is in most cases superior in intelligence and knowledge to the girls who sell her the goods. If she were taught to discriminate, it would be to the advantage of every manufacturer who makes an advertised brand of cotton goods.

It is just as much to the disadvantage of a cotton mill that its product should be asked for for a use to which it is totally unfitted as it is that it should not be asked for at all.

These tables will show that most shoppers have certain definite impressions which in many cases are wrong, and certain indefinite impressions which are more wrong, in regard to cotton cloth. They ask for a given muslin, because their mothers have used it, for a purpose for which their mothers never used it. On the other hand, they ask for another cloth in cases where they should ask for this first cloth, because ignorant of the best purposes of this first cloth.

This shows lack of education on the part of the buyer, and the chief end of good advertising is the education of the buyer. A discriminating buyer is the manufacturer's best asset. An indiscriminate buyer is of no advantage to anybody.

You should advertise, not to get your goods used for purposes to which they are not adapted, but to see that they are used in every case for purposes to which they are adapted.

You will notice also how affectionately a woman buyer clings to a name. She has the name of some brand of muslin, and she asks for that, however ridiculous the purpose for which she wants it, simply because it is so much easier to buy any fabric by name.

The lesson for you, Mr. Manufacturer, is to see that she knows the name of your goods and what they are used for.

A great deal of time is wasted by both the buyer and the salesgirl in trying to determine which is the best fabric for the purpose. If a woman knows the name of the goods she wants and knows that they are best adapted for her purpose, it will not be worth while on the part of a salesgirl to change her mind. The salesgirl who really knows the goods will appreciate the fact that these are the right goods for the purpose. Then, if she tries to change the buyer's intention, she is working against the best interests of the manufacturer, and it will be apparent to the shopper that she is.

You will see how tenaciously women hold on to names of cloth from generation to generation, how they hand these names around in their families and among their friends, because of certain merits in which they believe.

If this can be done by heresay evidence, how much more can it be done by general advertising.

Another thing that is shown by these tables is exactly what an advertiser of cotton goods should say in his advertising.

The woman wants to know for what purposes the cloth is adapted, as, for instance, sheets and pillow-cases, fine underwear, shirtwaists, or baby clothes; she wants to know what qualities it has, such as width, weight, laundering qualities; she is interested in the finish and in the expense, in the coarseness or fineness of the thread, according to the uses to which the material is to be put, and finally she must know the name and the trade mark, so that she can be sure of what she is getting.

These statistics are worth more than any amount of theorizing in regard to advertising cotton textiles, both as argument in favor of such ertising, and as material upon which to e the construction of the advertisements. THOMAS BALMER.

MUSLIN INVESTIGATION

"What She Asked for"

"For What Purpose?"

"Why Did You Sell It?"

"Why Did She Ask for It?"

"Why Did She Not Buy?"

ANALYSES OF ABOVE ON FOLLOWING PAGES

I. What she asked for

	Name of goods	No.	Selections
Definite Brands	Fruit of Loom	27	
	Lonsdale	12	
	Pride of West	6	
	Dwight Anchor	3	
	Wamsutta	3	
	New York Mills	1	
	Burleigh L. C.	1	
	Lockwood Mills	1	
	Jones' Cambric	1	
	Utica	1	
	Field's Longcloth	1	
	Total		57
Goods of a General Class	Unbleached muslin	4	
	Best muslin	4	
	Strong muslin	2	
	Bird Picture muslin	2	
	Unspecified muslin	28	
	Cambric	7	
	Nainsook	6	
	Longcloth	5	
	Indian linen	2	
	Sheeting	2	
	Total		62
	One (1) did not ask		1
	Total		120

II. For what purpose?

| | What she asked for | | | | | | | | | | | | | | | | | | | | | | | | | | | | | What she bought | | | | | | | | | | | | | | | | | | |

III. Why did you sell it?

What she bought	What she asked for	I. Wearing quality									II. Better adapted to purpose							III. Preference					IV. Wanted for fine wear			
		Muslin	Fruit of Loom	Lonsdale	Pride of West	Dwight Anchor	Sheeting	Lockwood Mills	Cambric	Total No. of times bought	Muslin	Fruit of Loom	Pride of West	Wamsutta	Lonsdale Muslin	Unspecified	Nainsook	Total	Fruit of Loom	Muslin	New York Mills	Pride of West	Total	Cambric	Nainsook	India Linen	Total
Wamsutta muslin		5	1	..	..	..	..	..	..	6	1	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Wamsutta percale		..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pride of West		..	2	..	1	..	..	..	..	3	1	..	..	1	..	..	..	2	..	..	..	1	1	..	..	..	..
Utica muslin		2	2	..	1	1	..	..	..	6	2	2	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..
Dwight Anchor		3	2	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..
Lockwood Mills		1	..	..	..	1	..	..	..	2	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
New Bedford Sheeting		..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Berkeley cambric		..	..	1	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	1
Berkeley longcloth		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Boston Mills		..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Alpine Rose L. C.		..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lonsdale muslin		..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Lonsdale cambric		..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	..	..	..	..	..	..	..	..
Burleigh L. C.		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..
White muslin jean		..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Fruit of Loom		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	1	..	..	10	..	..	..	..
New York Mills		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..
Linen batiste		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2
India linen		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2
Persian lawn		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	3
Pequot		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lily White L. C.		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total number of times asked for		11	7	2	2	2	1	1	1	27	10	3	..	1	1	1	2	18	9	1	1	2	13	3	3	2	8

III. Why did you sell it?—Continued

What she bought — What she asked for	V. Got good value							VI. Softer					VII. Launders well			VIII. Superior					IX. Economy			She selected it herself.	Cuts to good advantage.	Gives satisfaction.	Favorite for underwear.	Wider than Pride of West.		No. of times sold.
	Muslin	Muslin Unbleached	Longcloth	Pride of West	Fruit of Loom	Lonsdale	Total	Cambric	Muslin	Fruit of Loom	Dwight Anchor	Total	Fruit of Loom	Pride of West	Total	Lonsdale	Fruit of Loom	Wamsutta	Muslin	Total	Fruit of Loom	Lonsdale Cambric	Total						Total	
Wamsutta muslin																		2		2		1	1					1	1	12
Wamsutta percale																			1	1										2
Pride of West				1			1							1	1	1	1			2					1				1	11
Utica muslin													1		1											1			1	12
Dwight Anchor																														6
Lockwood Mills																														4
New Bedford Sheeting																											1		1	2
Berkeley cambric	1						1		1			1																	1	5
Berkeley longcloth																1				1						1	1		2	3
Boston Mills																														1
Alpine Rose L. C									1			1																		2
Lonsdale muslin						1	1		1	1	1	3																		6
Lonsdale cambric																														2
Burleigh L. C			1				1	1	1			2																		5
White muslin jean																														1
Fruit of Loom					1		1						2		2										2		1		3	16
New York Mills																														1
Linen batiste																														2
India linen																														2
Persian lawn																														3
Pequot		1					1																							1
Lily White L. C																					1		1							1
Total No. times asked for	1	1	1	1	1	1	6	1	4	1	1	7	3	1	4	2	1	2	1	6	1	1	2	2	1	4	1	1	9	100

IV. Why did she ask for it?

	Had used goods	Durability	Reputation	Launders well	Recommendation	Answers purpose	Soft	Bird Picture	Name appealed	Knew no other	Knew no brands	Mistook for cambric	Pretty, fine or sheer	Total
Fruit of Loom	7	4	4	..	9	1	1	..	1	1	..	..	..	28
Pride of West	2	..	2	..	1	..	..	..	..	..	..	..	..	5
Dwight Anchor	2	..	..	..	1	..	..	..	..	..	..	..	..	3
Lonsdale	3	2	1	1	..	1	1	..	..	1	..	..	..	10
Wamsutta	1	2	..	..	..	..	..	..	..	..	..	..	..	3
Cambric	1	..	..	2	..	2	..	..	..	..	..	..	..	5
Nainsook	1	..	1	..	1	..	1	..	..	..	..	1	1	6
Sheeting	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Unbleached muslin	..	4	..	..	..	..	..	..	..	..	..	..	..	4
Muslin	..	2	..	..	..	2	1	2	..	..	1	..	1	9
Lockwood	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Longcloth	..	1	1	..	..	1	1	..	..	..	..	..	1	5
Utica	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Jones' cambric	..	1	..	..	..	..	..	..	..	..	..	..	..	1
India linen	..	..	..	1	..	..	..	..	..	..	..	..	1	2
New York Mills	..	..	..	..	1	..	..	..	..	..	..	..	..	1
Berkeley L. C.	..	..	..	..	..	1	..	..	..	..	..	..	..	1
Field's L. C.	..	..	..	..	..	..	1	..	..	..	..	..	..	1
	18	18	9	4	13	8	6	2	1	2	1	1	4	87

V. Why did she not buy?

BRAND	No. of times not bought.	REASON: Unspecified	Coarse	Cracks	Expense	Too heavy	Poor finish	Too much finish	Too starchy	Flat thread	Wearing quality	Hard to iron	Light	Washing	Narrow	Work	Sheer	CHOSE INSTEAD: Pride of West	Fruit of Loom	Longcloth	India Linen	Lonsdale	Wamsutta	Alpine Rose L. C.	Linen Batiste	Utica Mills	New York Mills	Lily White L. C.	Dwight Anchor	Boston Mills	Persian Lawn	Berkeley L. C.	Burleigh L. C.	New Bedford	India Linen and Perrale Lawn
Cambric	7	3	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	1	..	1	1	..	..	..	..	..	..	..	..	..	..
Dwight Anchor	9	3	..	..	1	3	1	1	..	..	..	..	..	..	..	..	..	1	3	..	..	1	..	..	..	4	..	..	..	..	..	..	..	..	..
Fruit of Loom	16	8	..	..	..	1	..	..	4	1	2	..	..	..	..	..	..	4	..	..	..	1	2	..	..	5	1	1	2	..	..	..	..	..	..
India linen	2	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
Lockwood	2	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Lonsdale	9	3	3	..	..	..	..	..	..	..	2	..	..	1	..	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	6	..	..	..	..
Mohawk	2	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Nainsook	4	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	1	..	1
New Bedford	2	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..
Pride of West	5	1	..	..	..	1	..	1	..	..	..	..	..	..	1	1	..	..	1	..	..	..	1	..	..	2	..	..	1	..	..	..	..	..	..
Utica Mills	4	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..
Wamsutta	4	2	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Total	66	23	6	1	8	8	3	1	4	1	4	2	1	1	1	1	1	7	10	3	1	4	8	1	2	12	2	1	3	1	2	6	1	1	1

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE DESIGN SCHOOL.

LESSON 8. GRANITE WEAVES.

This system of weaves, no doubt is one of the most interesting divisions of weaves, for textile purposes, these weaves finding extensive use in the manufacture of worsted suitings and trouserings, at the same time being frequently used in the construction of woolen suitings, wool, worsted, cotton and silk dress goods, ribbons, etc.; in fact, granite weaves are used in all kinds of textile fabrics where a *broken-up effect* in the cloth is required.

Granite weaves are obtained in various ways, some of the best weaves being those derived from satins or twills, i.e., granites having our regular satins or twills for their foundation. Other granites are obtained by means of arranging certain effects after a given motive.

The present lesson will deal with the construction of granite weaves having for their foundation satins or twills, and the other system of granite weaves, previously referred to, will form the subject for another lesson.

CONSTRUCTING GRANITES FROM REGULAR SATINS.

Rule:—Indicate the respective satin weave, filling effect, on your point paper, then add risers on top, oblique, at the side or bottom, as the case may require, uniformly to each foundation satin spot, until a well balanced granite weave will be the result.

One of the points to be kept in mind must be, *not to run into a twill or diagonal effect*, an affair which will readily result provided a designer does not exercise care; again not every combination will result in a perfect granite, the student will have to experiment, more or less, with each and every new example until obtaining a perfect result.

A good plan is to lay out the foundation, satin weave (filling effect), for two repeats each way and practice, adding spots (risers) in the centre portion of this "layout," always placing a certain riser as added to one spot of the satin, at the same time to each and every respective spot of the satin in said layout before starting with another additional riser, to the foundation weave. This will prevent riser from running into risers as will be the result, provided adding several additional risers to one foundation spot, previously to transferring these additional risers to the next spot of the foundation weave.

In order to explain this subdivision of granites, Fig. 1 to inclusive 40 have been given, and of which:—

Fig 1 has for its foundation the 8 leaf satin as shown by means of ⊡ type. Adding to each spot of this 8 leaf satin one riser on top, one to the right, one oblique, results in the granite shown in weave Fig. 1, repeating on 8 warp-threads × 8 picks, it being one of the most frequently used weaves of this system; a weave which for years and years to come will find extensive use every season product in any worsted mill. Another excellent granite, for worsted fabrics, for men's wear, is shown in connection with satin Fig. 2, the same having again the 8 leaf weave for its foundation, adding in this instance 3 risers on top of each other, to the right, of each foundation satin spot.

Weaves Figs. 3, 4, 5, are constructed correspondingly from the 8 leaf satin, each weave repeating on 8 warp-threads × 8 picks.

In connection with weaves Figs. 3 and 4, we added three additional risers to each foundation or satin spot, whereas in connection with weave Fig. 5, we added four of these additional spots to each foundation spot. All three granites refer to tight interlacing weaves, reflecting in this instance to light weight worsteds for men's or women's wear, or to cotton dress goods, silk ribbons, or similar light weight fabrics.

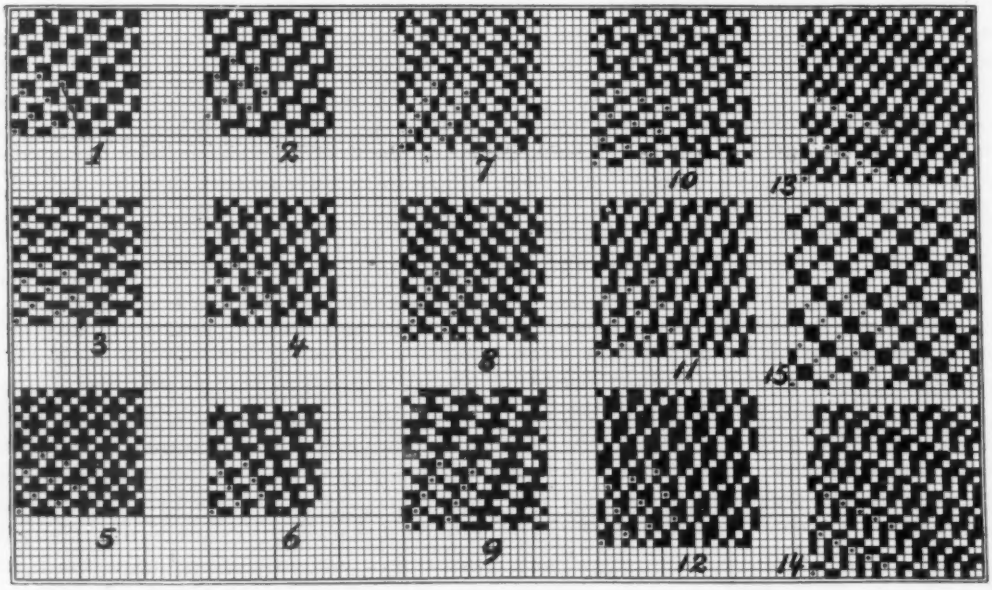
Weave Fig. 6 has for its foundation the 7 leaf satin, adding to the foundation spot three

risers, and being a weave used extensively in the manufacture of light weight suitings as well as cotton and worsted dress goods. It is again one of our standard weaves found in every season's samples. The repeat of this weave is 7 warp-threads × 7 picks.

Weaves Figs. 7, 8, 9 have for their foundation the regular 9 harness satin, filling effect, each weave producing an excellent granite, and of which weaves, Figs. 7 and 8 refer more particular to worsted and cotton dress goods granite, repeating on 10 warp-threads × 10 picks. Weave Fig. 10 refers to worsted suitings as well as dress goods, whereas Figs. 11 and 12 more particularly refer to worsted for men's wear.

Weaves Figs. 13 and 14, have for their foundation the regular 11 harness satin, the granite obtained referring to worsted as well as cotton dress goods; the weave repeating on 11 warp-threads × 11 picks.

Weaves 15, 16, 17 and 18, show us four ex-



whereas weave Fig. 9, besides finding extensive use for dress goods, at the same time is used extensively in connection with woolens and worsteds for men's wear, resulting in an excellent, fine granite twill effect.

Examining this weave more in detail, with reference to interlacing of warp and filling, will show us that every pick alternately acts for five warp-threads as a face pick, and then for four warp-threads as a back pick, in this manner permitting an easy interlacing of the filling with the warp. The repeat of weaves Figs, 7, 8, 9 is 9 warp-threads × 9 picks.

Weaves Figs. 10, 11, 12, have for their foundation the 10 harness satin, filling effect, each weave being an excellent, well balanced,

amples of 12 harness granite weaves, having the 12 harness satin, filling effect, for their foundation; being weaves used extensively in the manufacture of worsted suiting, as well as in connection with other weaves for worsted trouserings. These four weaves repeat on 12 warp-threads and 12 picks.

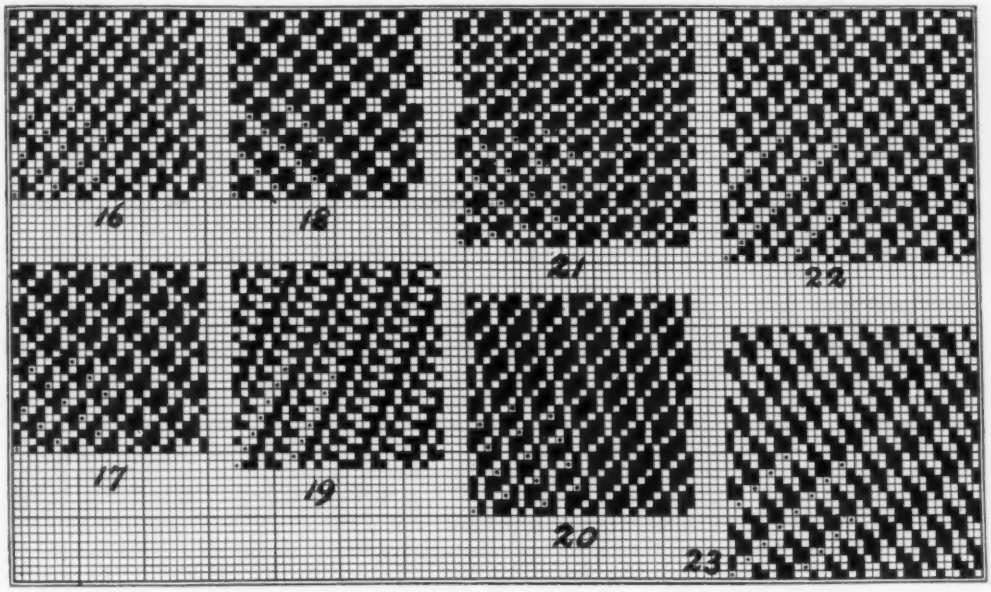
Weave Fig. 19 has for its foundation the 13 harness satin, the new weave repeating on 13 warp-threads × 13 picks.

Weave Fig. 20 has for its foundation the 14 harness satin, the granite repeating on 14 warp-threads × 14 picks.

Weave Fig. 21 shows an excellent granite, repeating on 15 warp-threads and 15 picks, having for its foundation the 15 leaf satin.

Weaves Figs. 22 and 23 show two examples of 16 harness granites, both weaves repeating on 16 warp-threads × 16 picks, having for their foundation the 16 leaf satin filling effect. Both weaves are excellent granite weaves; weave Fig 22 being a weave suitable both for men's as well as women's wear fabrics, whereas weave Fig. 23 is more particularly adapted for worsted suitings.

Having thus explained the construction of granite weaves from our satins, filling effect, using the latter in their proper shape for foundation, we now come to



GRANITES PRODUCED FROM SATINS, HAVING THEIR POINTS OF INTERLACING DISTRIBUTED.

This will be readily understood by the student consulting diagram Fig. 24 and weave Fig. 25, and of which diagram Fig. 24 shows us the 5 leaf satin, placed on every other warp-thread only, i.e., every other warp-thread is missed in laying out the foundation weave. Weave Fig. 25 shows the granite weave obtained by using diagram 24 for the foundation, the result being an excellent granite for worsted suitings and trouserings; the weave repeating on 10 warp-threads × 5 picks, for the fact in distributing the 5 leaf satin on 10 warp-threads, i.e., using every other warp-thread only (5×2) will result in this repeat of a granite. In the same manner as thus explained in connection with weave Fig. 25, weaves Figs. 26, 27, 28 are obtained by using the 5 leaf satin again according to diagram Fig. 24 for their foundation.

Weaves Figs. 29, 30, 31 have for their foundation the 7 leaf satin, using every other warp-thread only when laying out the satin weave, the new granite thus repeating on (7 × 2) 14 warp-threads and 7 picks.

Weaves Figs. 32, 33, 34 have for their foundation the 8 leaf satin, considering when laying out this foundation weave every other warp-thread only; the new weaves consequently repeating on (8 × 2) 16 warp-threads and 8 picks.

Diagram Fig. 35 shows us a still further distribution of the 5 leaf satin for the foundation of a granite, using in this instance only one warp-thread out of every three, i.e., consider one warp-thread, miss two until repeat obtained.

Weave Fig. 36 shows us a granite constructed in this manner, i.e., using diagram Fig. 35 for the foundation, the new granite repeating on 15 warp-threads and 5 picks.

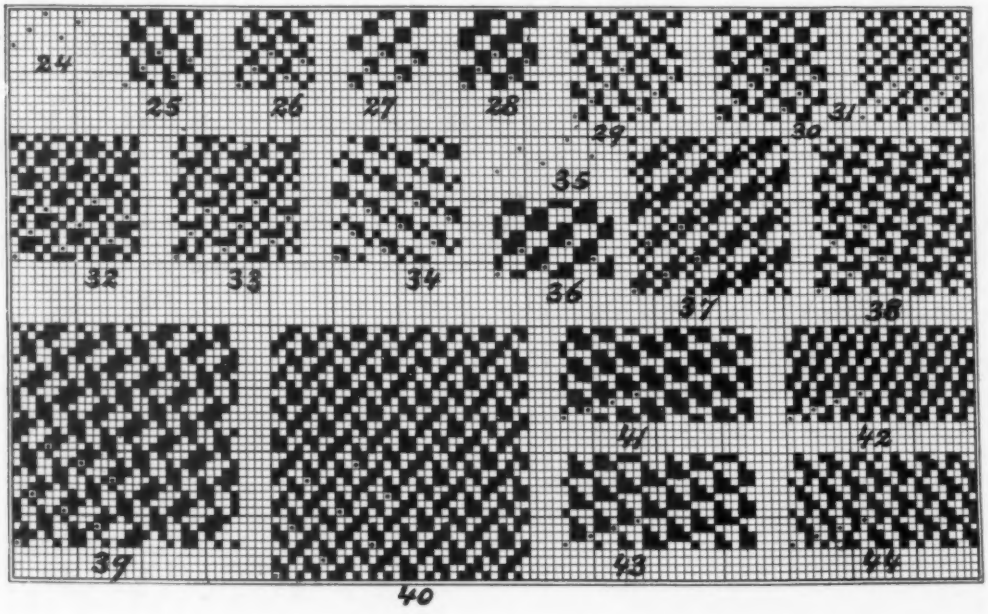
We now come to distributing our foun ation again differently, i.e.

DISTRIBUTE THE FOUNDATION SATIN BOTH WARP AND FILLING WAYS.

In this manner weaves Figs. 37, 38, 39 and 40 are obtained. Weave Figs 37, 38 have for their foundation the 5 leaf satin, using every other warp-thread and every other pick only when laying out the foundation, an arrangement which naturally will result in a granite repeating on (5 × 2) 10 warp-threads and 10 picks. Both weaves, Figs. 37 and 38, are excellent weaves for worsted suitings as well as cotton and worsted dress goods.

GRANITES HAVING FOR THEIR FOUNDATION REGULAR TWILLS.

In order to show the student how to produce these granites, weaves Figs. 41, 42, 43, 44 are given, and which weaves will readily show him the numerous variety of new weaves possible to be constructed in a similar manner from any one of our various 45° twills. The foundation weaves for every one of these four granite weaves is the $\frac{1}{3}$ 4 harness, 45° twill, using every third warp-thread only when laying out the foundation twill, as shown by means of ⊡



Weave Fig. 39 has for its foundation the 7 harness satin, using every other warp-thread and pick only when laying out the foundation weave, the new granite repeating on 14 warp-threads and 14 picks.

Weave Fig. 40 has for its foundation the 8 leaf satin, considering every other warp-thread and pick only when laying out said foundation weave, the new granite repeating on 16 warp-threads and 16 picks.

Weave Fig. 39 is more adapted for dress goods only, whereas weave Fig. 40, can be used both, for novelties in dress goods as well as fancy cassimeres and worsted suitings.

type; the new granite weave thus resulting in a repeat of (4 × 3) 12 warp-threads and 4 picks.

Having thus given a good collection of some excellent granite weaves, we now wish the student to produce for his exercise the following new granites:—

LESSON.

Construct one new granite each for 9×9, 10×10, 11×11, 12×12, 13×13, 14×14, 15×15, 16×16, 10×5, 14×7, 16×8, 18×9, 20×10, 15×5, 21×7.

Woven goods were used as clothing by the Egyptians 6,000 years ago.

THE MANUFACTURE OF SILK FROM FIBRE TO FABRIC.

II.

BREEDING.

After the cocoons are collected, as previously mentioned, such as are intended for breeding are put into a room heated to 66-70 deg. F. The cocoons remain in the room for about fifteen days, during which time the silk moth has been formed in the interior of the cocoon, said moth emitting a peculiar kind of saliva, with which it softens one end of the cocoon and is thus enabled to push its way out. However, the discharging of this saliva greatly injures the silk on the cocoon.

A few days after the female moths have laid their eggs they die, not being provided with any organ of nutrition. The eggs are gradually dried, and stored in glass bottles in a dry, dark place till the next spring. The best breeds of silkworms go through the different changes but once a year, yielding in return large cocoons, and giving very little trouble to the silk grower, whereas some breeds go through these changes two, three or four times a year, yielding in turn an equal number of crops of cocoons. These breeds of silkworms are classified as pollyvoltines, those yielding two crops are known as bivoltines, those yielding three crops, as trivoltines, etc. The silkworm yielding the greatest number of crops, known as dacey, and is found in Bengal, the yield being eight crops per year.

STIFLING.

The cocoons which are not used for breeding, but intended for commerce, are subjected to a process of stifling, i. e., destroying the vitality of the chrysalis by steam. The process consists in submitting the cocoons to a steam bath at a uniform temperature of 212 deg. F., the steam rising practically uncondensed, under an iron receiver, which covers the cocoons. The chrysalids are thus suffocated by the different heat which penetrates the cocoon thoroughly, while the web of the cocoon retains its natural condition. The apparatus required for this process consists of a basin connected by a pipe with a steam boiler, two circular plates running on rails, on which the trays holding the cocoons are placed, a bell receiver for the steam, supported by two iron uprights suspended over a pulley and having a counterpoise to permit an easy raising and lowering. The bell is provided with a thermometer, and a stop cock for letting off the air and steam when required. The method of procedure is as follows: Fill the basin partly with water (about four inches high), admit the steam to it and lower the bell, having the stop cock open. Raise the temperature until the thermometer registers 210 to 212 deg. F.; the cock must then be closed and not opened again during the operation. The bell is next raised to allow the plate on which the trays of cocoons are placed to be run over the basin, and then lowered again into the water until the edges are covered, but not touching the bottom of the basin. In about fifteen minutes the bell is lifted, and the cocoons which have been steamed are run off, and a second lot which have been previously made ready, are placed on the plate and proceeded with as before.

For perfect work care must be taken to maintain the internal temperature of the bell receiver at the same degree, the water must always be boiling, and a fresh supply regularly admitted to take the place of that evaporated in the steam. Although the killing of the chrysalis by steam does not damage the silk at all, as was sometimes the case when heating the cocoons for about three hours in an oven heated to 145 to 155 deg. F., yet the steam process has one serious defect—some of the pupae may burst and soil the silk, and the fibres may soften somewhat, being apt to stick together and render subsequent reeling more difficult.

In the warm countries, the dry heat stifling can be accomplished by simple exposure to the sun. There the cocoons need only to be fully exposed to the rays of the sun from 9 o'clock in the morning until 4 o'clock in the afternoon. Two or three days of such exposure are sufficient, but, as strong wind can sometimes destroy the effect of the sun's warmth on the cocoons, it is well to have long boxes, to be covered with glass frames in which the cocoons are placed. This arrangement will increase the heat and, by ab-

sorbing the air of the box, stifle the chrysalis most surely. A crack should be left in the glass cover of the box to allow the evaporation of the moisture, which otherwise would collect in large drops upon the glass, and, falling back upon the cocoons, would keep them moist for a longer time.

REELING.

The cocoons are now ready to have the silk filaments unwound from them and the process is known as reeling. There are several systems of reeling in use, the one chiefly used in Europe being the French system. In this system, four to twenty cocoons, according to the size of the thread desired, are placed into each of two compartments in a basin of warm soapy water, below the reel, the object being to assist the operation of reeling the filament off by softening and partially dissolving the gum which binds the layers of silk more or less together. The cocoons remain in the water during reeling, and the filaments from the cocoons in each compartment are gathered together by beating them with birch twigs to find the ends, and, after passing through two separate perforated agates, a few inches above the surface of the water, they are brought together and twisted around each other several times, the object being to unite closely the several filaments which have been softened by the soap solution, and produce greater roundness and smoothness, as well as to squeeze out any superfluous water in the completed thread. The threads are then separated and passed upward over the traverse guide eyes to the reel. The traverse moves to and fro horizontally, distributing the thread in an even manner on the reel. The rapid traverse of the thread from side to side of the skein in reeling facilitates further handling, and unwinding without tangling, the natural gum of the silk sticking the threads to each other sufficiently to keep the thread in the position in which it was reeled.

The filament composing the cocoon is somewhat finer in the floss or beginning, and becomes thick at the more compact part of the cocoon, and then very gradually diminishes in diameter until it becomes so fine as to be incapable of standing the strain of reeling. This is because the silk from one of the worm glands becomes exhausted, thus resulting in a fibre of one-half the size and strength of the original fibre.

When one of the filaments breaks, or the end on one cocoon is reached, the reeler takes a fresh cocoon, and with thumb and forefinger twists the end of the new filaments around the running thread which becomes a constituent part of it from moment.

The operation of reeling requires long experience and skill in order to obtain perfect results. For instance, the reeler has not only to see that the threads are free from all knots and adherent impurities, but must also increase or diminish the number of cocoon filaments to be doubled together, in order to obtain raw silk threads of uniform diameter and weight, not merely because different cocoons yield threads of divergent thickness, but also because of the variations in the thickness of the filament on the same cocoon, as just pointed out. The reelable length on some cocoons will reach 4,000 yards, in others only 300 yards, a fair average being about 1,000 yards.

Good reeling is of the greatest importance to the silk manufacturer, which is clearly demonstrated by the fact that Italian or French raw silk, even at an advanced price, is more economical for him to use compared to a similar quality of Chinese or Japanese silk, which generally is of inferior reeling.

Imported raw silk comes in the form of skeins as made in reeling, which vary in weight from one to several ounces, being packed into bundles called "books," weighing from 5 to 10 pounds. In China and Japan these books are usually packed into bales varying from 100 to 160 pounds.

COMPOSITION OF SILK.

Under the microscope, the raw silk filaments appear as structureless, vitreous rods, consisting of two single threads of "fibroin," either closely adherent to each other or separated by a small space filled with a gummy substance, known as "sericin." In the raw silk the covering of sericin is either perfectly homogeneous, with a faint outline, or else exhibits small cracks and folds at intervals, being altogether lacking in some places or if present only in isolated clots.

Fibroin has the appearance of pure silk, being brilliant, soft, and of a pearly lustre, and has the chemical composition, $C_{15}H_{23}N_5O_6$. The coating of the fibre, or sericin is gelatinous and gummy, and has the formula $C_{15}H_{25}N_5O_8$.

The glands of the silk worm contain semi-liquid fibroin alone, and on exposure to the air the surface is acted upon by oxygen, thus transforming the external pellicle into the more soluble form of sericin.

A quantitative analysis shows silk to be composed of the different substances as follows:

True silk fibre or fibroin about 60 per cent.

Silk gelatine or sericin about 20 per cent.

Fat, resin, coloring matter, and mineral substances about 2 per cent., the balance being taken up by moisture.

The fibre dissolves with difficulty in soda and potash solutions. Sulphuric acid and sugar dissolve it with a rose-red coloration, and hydrochloric acid with violet coloration. It burns in the same manner as wool, leaving a black charred mass, but since the fibre contains no sulphur, no smell of horn is evolved as with the wool fibre.

Silk will readily absorb moisture, the fibres being so hygroscopic as sometimes to take up 30 per cent., although the standard amount allowable is only 18 per cent.

Silk can be dyed readily in all shades of color, especially by the use of coal-tar dyes. It also exhibits a great affinity for other substances, particularly for mordants, a property on which is based the practice of loading silk in the dyeing process.

SILK THROWING.

When the silk is received by the manufacturer, in the form of skeins packed in bundles, as previously mentioned, it is subjected to several processes in order to work it into proper shape for weaving or what other purpose it is desired to use it.

The first is transferring the silk from the skeins of more or less irregular length, to bobbins, by means of an ordinary winder. Each skein is stretched on one of the light revolving frames for holding it, and the thread passed through the traversing guide, to the bobbin, which rotates on a horizontal axis, motion being communicated to the bobbin by a little wooden roller on the bobbin spindle. This spindle, as placed in two grooves, is parallel to a light shaft, carrying at one end a metal wheel, and by having the little roller in frictional contact, it gives the revolution to the bobbins. A suitable cam gives the traversing motion to the guides, said traverse being according to the length of the bobbin.

The second process is cleaning, which is accomplished by transferring the silk from one bobbin to another, and in doing so passing the thread through a cleaner, which is built somewhat like a comb, with plates placed so close to one another that any knot or irregularity upon the silk is caught and the machine automatically stopped until the attendant removes the cause. These plates can be so accurately adjusted that an increase in the size of the thread, caused from bad reeling, stops the machine.

The third process is doubling or throwing, in which process the silk is made into the desired kind of yarn, there being three principal classes of yarn made in this manner, viz: singles, trams and organzines.

Singles, also termed "dumb" singles, is made by simply doubling two or more raw silk threads, and winding, without twisting, them together. This silk produces a very soft and lustrous silk fabric which cannot be equaled with twisted yarns.

Singles, without twist, is employed for such fabrics as may be advantageously manufactured with undyed threads, such as bandannas, corahs, pongees, etc. Silk cloth so produced will possess great softness and brilliancy. This fact demonstrates the advantage of not imparting to silk any more twist than is absolutely necessary for weaving and dyeing.

For general purposes, it is essential that the threads be dyed prior to being woven, and in order to combine the separate filaments, (each thread being composed of four or more single cocoon filaments united only by cohesion and the natural gum of the silk), and to prevent their separation in the dyeing process, it is necessary to twist them together and thereby obtain a firm and com-

pact thread, the size and quality of which depend upon the uniform number of cocoon filaments of which it is composed, and the attention and care bestowed in reeling.

Tram silk is composed of two or more single threads without individual twist, and which are united into one thread by slightly twisting them together, for the more the twist, the less the lustre and harder the feel; also a very slight twist enables the yarn to "cover" better when woven into cloth. If two threads are used, it is termed two thread tram; if three, three thread tram, etc. Tram silk is made from the poorer qualities of fibre and is used principally for filling yarns.

Organzines consist of several single threads which are first individually twisted in one direction, after which they are doubled and twisted in the opposite direction to the first twist. The twist thus imparted to the yarn adds strength to it; however, an excess of twist is a disadvantage, since it reduces the glossiness of the yarn. It is made from the better qualities of cocoons and is used chiefly for warp yarns.

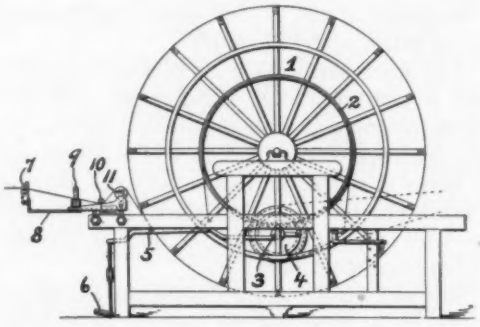
In judging silk to be made into tram or organzine, a mistake in judgment by the manufacturer may mean considerable loss to him. The greatest of care is required in order to have satisfaction in its after manufacture, it being a fact that some manufacturers can get a better fabric as to appearance and wear from a low quality of silk than others can from the best quality. The organzine, on account of being used for warp, is of course stronger than the tram (filling), its strength being obtained by the previous twisting of the single threads. For heavy dyeing purposes (weighting) a soft spun silk is desirable.

(To be continued.)

AN IMPROVEMENT TO WOOL AND WORSTED SECTION WARPERS.

The purpose of the improvement is to place the warp on the reel in a wavy line as compared to the straight line now used, in order to permit a larger amount of yarn to be conveniently placed on the reel. To do this each section of the warp as it is wound on the reel is given a slight vibratory or traverse motion.

The accompanying illustration is a side view of this warper, clearly showing its method of operation. In the illustration, 1 indicates the reel of the machine on which the sections of warp are wound, said reel being driven by friction by means of a flange, 2, as secured to the side of the reel, which is in contact with a friction disk, 3, as positively driven from the pulley, 4. The shaft carrying the friction disk, 3, is carried in a lever, 5, which may be operated through a treadle, 6, by the flange, 2, thus providing a control for the motion of the reel, 1. The guiding arrangement for the threads of the section to the reel consists of a large stationary reed, 7,



which is carried in a bar, 8, and a smaller reed, 9, in front of it, and which is capable of adjustment. In front of this reed is a fixed guide roller, 10, and in front of this is a traversing roller, 11, which has a cam groove formed upon one end. Fixed to the side of the reed frame is a conical pin which projects into the cam groove of roller, 11, hence as this roller revolves, its cam groove will cause it to traverse slightly, sideways, to and fro, in front of the reel, and as said roller revolves a number of times while the reel revolves once, the traverse of the yarn will take place a corresponding number of times on each layer of yarn on the reel.

When one section has been completed, the reed frame as carrying reed, 9, and rollers, 10 and 11, is moved over a short distance horizontally, i. e. in proper position for guiding the next section on to the reel, this procedure being continued until the complete warp is on the reel and when the same is beamed off in the customary way on to its warp beams.

THE DESIGNING AND WEAVING OF FIGURED DAMASK.

By this we mean the designing and manufacture of a damask fabric, woven by means of compound harnesses, the object being, to produce large designs by means of small Jacquard machines, at the same time simplifying the work for the designer, since in this instance all he has to do is to indicate ground from figure on the point paper, no introduction of the weave for either effect being required. The weave in this instance is introduced into the fabric by means of a special set of harnesses, placed in front of the comber board of the Jacquard machine.

Tying-up of Jacquard looms with extra compound harness, consists, as mentioned before, in applying two separate systems of harness in the loom. The warp threads, after having passed through the Jacquard harness, are passed through a special harness in front. Each system of harnesses performs its special duty, although they are both working the same warp. The Jacquard harness is used for forming the general design on a large scale; whereas, the second harness divides this pattern into its proper working details, (twills, satins, or any other desired weave). This tie-up is necessary in the manufacture of damasks and similar fabrics, where a large number of warp ends is required to be used.

In the tying-up of the Jacquard harness, generally four heddles, or one mail with four eyes, to one leash are used, although more or less heddles, or eyes to one mail, might be employed. Which method to use, i. e., whether to tie four heddles to each leash or to use mails with four eyes, remains at the option of the manufacturer, one preferring the one style, another adhering to the other; however, as a rule, using four heddles to one leash will be easier for the weaver, since in this instance each individual warp thread can be handled better by him than if they all are drawn in the one mail, and when one naturally has to be placed above the other, of said set of four warp threads.

The Jacquard machine in this instance does the general figuring in 4's for the design, whereas the compound harness, as mentioned before, introduces the weave. Having thus explained the general idea of the Jacquard harness, i. e., each harness cord of leash carrying four warp threads, and which naturally are operated in unison by the Jacquard machine, we now will have to dwell upon the compound harness, the object of which is to introduce the weave into the fabric.

This compound harness consists of extra long heddles, permitting a three-fold operation of each warp thread, viz:

(1) When in centre position they will not effect a warp thread in any shape or form, permitting it solely to be operated by the Jacquard harness;

(2) When raised they will lift its respective warp thread from the bottom plane of the shed to the top plane of the shed, and;

(3) When lowered, they will press its respective warp thread from the top plane of the shed to the lower plane of the shed. Thus we will see that each and every warp thread is operated in two ways, first, by means of the Jacquard machine for the purpose of figuring, and second, by means of the compound harness properly interlacing.

The compound harness may call for 4, 5, 6, 7, 8, 9 or 10 harnesses, according to the weave used, and by which we mean that if we use 4 compound harnesses in the set, we can tie off the warp thread in connection with any weave repeating on 4 harness, again if we use 5 compound harnesses, we can use 5 harness weave for this purpose, and so on, permitting in connection with 10 compound harness used, the tying off of the warp threads by means of any suitable 10 harness weave.

As a rule eight harnesses are used on account of the popularity of the eight leaf satin, however we will not neglect to describe other weaves as we go along, since they also are frequently used.

Before going any further with our explanation, we will mention one point, that in connection with the four warp threads being operated in unison with one harness cord or leash from the Jacquard machine, we thus can use in connection with a 200 Jacquard machine tied up straight through, a design repeating on 800 warp threads: again for a

400 Jacquard machine, straight through tie up, the repeat of the design will call for 1600 warp threads, and in the same manner a 1200 Jacquard machine, straight through tie up, will permit us to use 4800 warp threads for one repeat of the design. Again if we change the straight through tie up to a point tie up, the reader at once will see the immense repeat of the design, since in this instance a 1200 Jacquard will give us a repeat of 9600 warp threads for the design, and so on. This producing of large designs by this system of compound harness, is readily explained by means of the last given example, using in the

Fig.1

latter instance 8 warp threads from each needle, thus: 1200 (size of machine) × 4 (warp threads operated by each harness cord) = 4800 × 2 (point tie up) = 9600 warp threads (i. e., repeat of design).

This little example shows the advantages of this method of tying up looms for figured work over others.

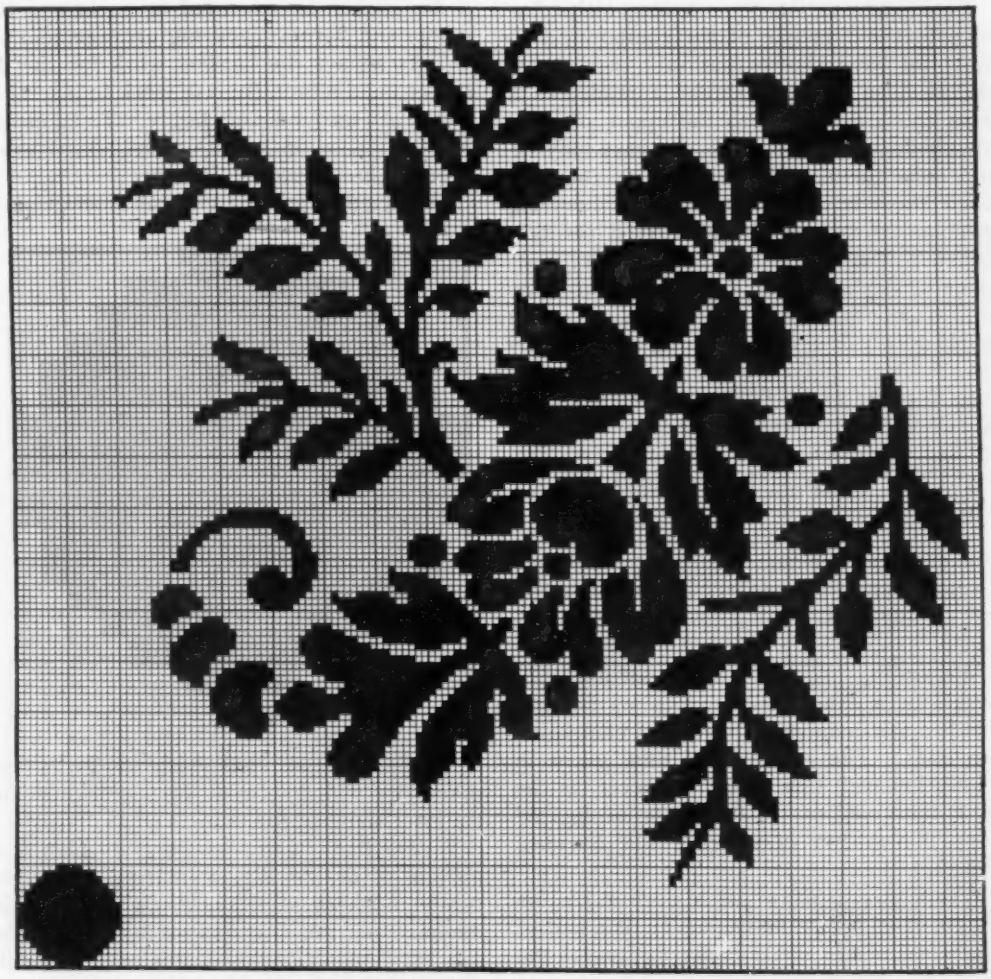


Fig. 2

The Jacquard machine, as mentioned before, does the figuring according to the design. Every square on the design in this instance indicating the raising or lowering of 4 warp threads. Again, as previously mentioned, no weave is put either in the ground or figure portion of the design on the point paper, and when consequently it will be readily understood that any number of squares on the point paper will call either for ground or figured effect. Employing 4 warp threads on the loom for each square on the point paper, would naturally call for an immense amount of warp threads, either up or down in the shed, i. e., either ground or filling effect, side by side in the shed. For example, let us consider say 20 squares ground effect. These 20 squares × 4 = 80 warp threads side by side, ground effect, in the fabric. Now it will readily be understood that we

could not float the filling over or under 80 warp threads, as the case may be, without making an imperfect fabric. This is prevented by the compound harnesses, which, for example, in this instance, we will consider arranged for 8 harnesses, and working on an 8 leaf satin principle.

From explanation given before with reference to the principle of the compound harness, we have shown that said heddles are able to raise any warp thread, threaded to it, from the lower plane to the upper plane of the shed, or vice versa, as the case may be, and consequently they will act on these 80 warp threads quoted, raising or lowering them, as the case may be, after the 8 leaf satin principle from the lower plane to the upper plane of shed, or vice versa, as the case may be, i. e., in the same way as if dealing with a fabric drawn on 8 harness straight, and operated by means of the 8 leaf satin. With reference to tie up of the Jacquard harness as well as its compound harnesses, the reader will be advised to consult pages 58 to 63 of "Jacquard Machine Analyzed and Explained." *

We will now explain

HOW TO PROCEED TO MAKE DESIGNS

for these fabrics, as well as how the interlacing of warp and filling takes place in the loom.

Weave Fig. 1 shows us a portion of a sketch for a damask table cloth, to be executed in this manner by means of compound harnesses. The explanation thus given in connection with this design, however, at the same time applies to any class of figured work this system of weaving will be used with.

Weave Fig. 2 shows us a portion of this design, executed on point paper. We had to select one of the small centre figures of the completed design only for this purpose, on account of keeping within compass of the page of the journal. However, sufficient of the design is thus given in order to show or guide the reader to prepare any elaborate design in this manner. The portion of the design given in Fig. 2 refers to 150 squares warp ways, and which in this instance equals 600 warp threads, since we suggest that the affair is executed with 4 heddles for each Jacquard harness cord. Fig. 2 shows how these designs have to be prepared, shows how simple this kind of designing is; and at the same time, Fig. 1 shows again how elaborate a design can be executed by means of this compound harness weaving arrangement.

It is always the hardest work for the designer on common damask work to insert the weave on ground and figure. It takes the most of his labor to do this, and all this labor is saved in the present instance.

Having now given a general description as

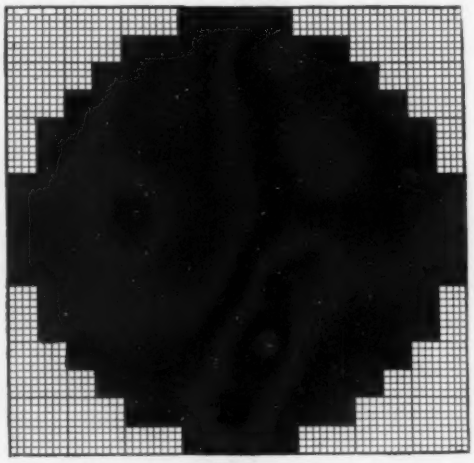


Fig. 3

well as illustration of how the design is prepared, we will now more closely investigate the interlacing of the fabric.

Weave Fig. 3 gives us a ground plan of a portion of design Fig. 2 enlarged in 4's, as compound harness weaving will do. It is in this way that the Jacquard machine treats the general design, Fig. 3, in this manner, indicating the corresponding lower left hand corner spot effect on design Fig. 2.

Weave Fig. 4 shows us the common 8 leaf satin, and which in this instance we will consider as risers.

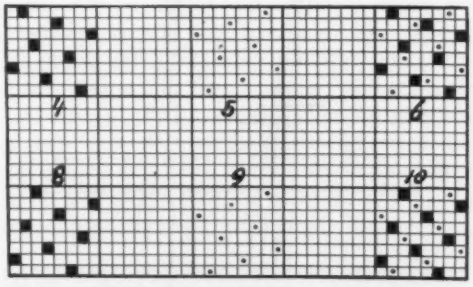
Weave Fig. 5 shows us the same 8 leaf satin (twill reverse), and which in this instance we will consider as sinkers.

Weave Fig. 6 shows us the combination of

*Circulars of this work mailed, postage free, upon application to this office.

the two satins as required for compound harness weaving. Every ■ in this diagram indicates that its respective warp thread, if in the lower plane of the shed, is raised in the upper plane, and vice versa. Every [·] indicates that its respective warp threads, if in the upper plane of the shed, are placed by the compound harnesses in the lower plane of the shed.

Diagram Fig. 7 shows the portion of the



fabric as given in connection with Fig. 3, executed by the compound harnesses, i. e., the analysis of a woven portion of the fabric. In this instance, we notice a clear cutting off at the edges of the design, i. e., risers opposite sinkers, where warp and filling effects, i. e., ground and figure effects join. This (Fig. 6) will be the combination of the 8 leaf satin

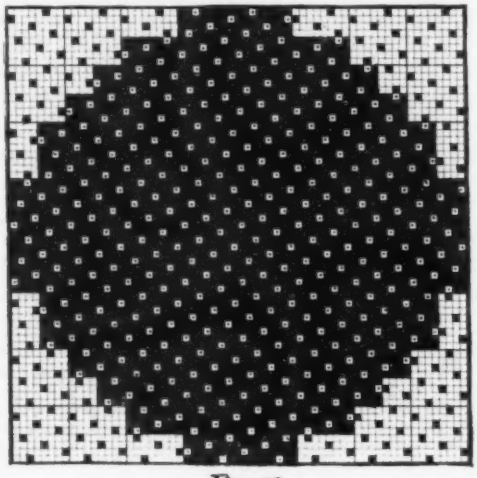


Fig. 7

most advisable to use; however, very frequently we find the combination as shown in connection with weaves Figs. 8, 9 and 10, and its fabric structure Fig. 11 is used. In this instance the cutting off between ground and figure effect, as will be readily seen, is not as perfect as in the previous arrangement. However, as mentioned, this combination of the 8 leaf satins is frequently met with in fabrics, and for which reason diagram Fig. 11 has been prepared.

We will now give

A COLLECTION OF VARIOUS WEAVES FOR COMPOUND HARNESSES.

and their combination for practical work.

Weave Fig. 12 shows us the 4 harness

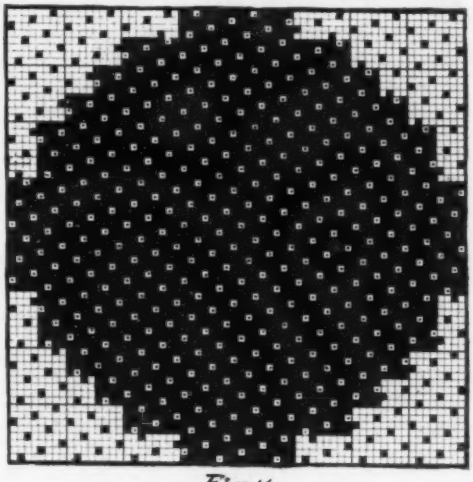


Fig. 11

broken twill for one effect. Weave Fig. 13 the same weave for the reverse effect, and Fig. 14 the combination of both weaves for compound harness work.

In the same manner weaves Figs. 15, 16, 17 treat the 5 leaf satin, calling in this instance for 5 compound harnesses in front of the comber board of the Jacquard machine.

Weaves Figs. 18, 19 and 20 show the arrangement of the 6 leaf satin for this kind of work, calling for 6 compound harnesses.

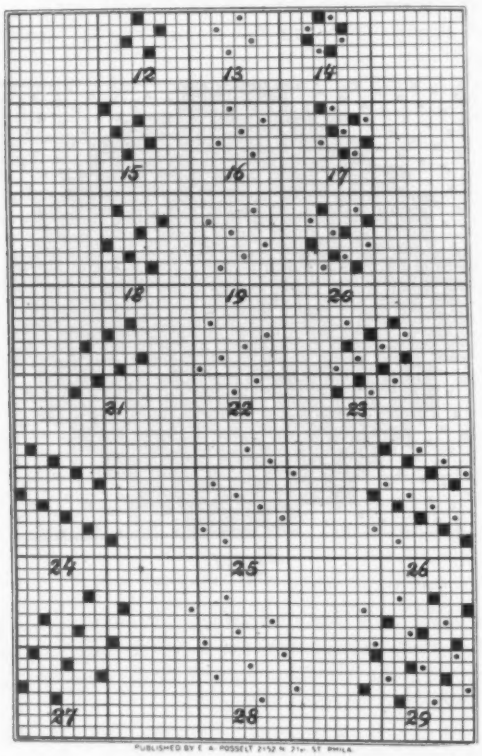
Weaves Figs. 21, 22 and 23 in this manner treat the 7 leaf satin respectively; weaves Figs. 24, 25 and 26 the 9 leaf satin, and weaves, Figs. 27, 28 and 29 the 10 leaf satin.

Thus far we have dealt only with one set of compound harness, said compound harness operating both the raising as well as the low-

ering of respective warp threads, as the case may require. This is the most generally used arrangement of compound harnesses, since in this instance fewer harnesses are required than if we used

TWO SETS OF COMPOUND HARNESSES,

one respectively for raising, the other for lowering the warp threads. However, since this system of mounting the looms is also met with, we will give a short description of it.



In order to simplify the matter diagram Fig. 30 has been prepared, giving the method of threading the warp. A in this instance shows a mail in the Jacquard harness containing 4 eyes, i. e., carrying 4 warp threads. B shows 4 harnesses, arranged for raising the respective warp threads from the lower plane of the shed to the upper plane if so required. C shows 8 compound harnesses for lowering the respective warp threads when so required from the upper plane of the shed to the lower. Although the mounting of the loom thus will get somewhat more complicated, yet at the same time the designing is not changed. In this instance we may select a totally different weave for warp effect against filling effect, as more or less regulated by dealing with a light or light interlacing structure, a light or heavy fabric.

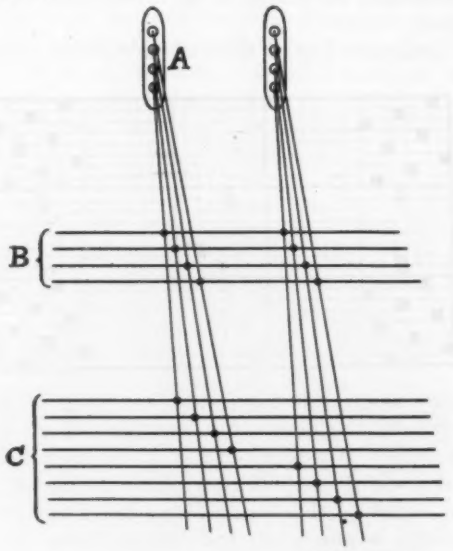
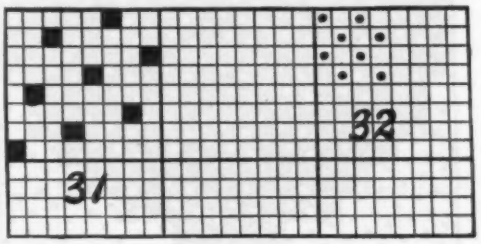


Fig. 30

In order to explain the combination of two weaves in connection with these fabrics, the weaves and diagrams, Figs. 31 to 38 inclusive, are given. First let us consider weaves Figs. 31 and 32, and in which instance the first shall serve for the ground, and the latter for the figure, although the reverse may be the case. The weaves as given show



their proper position with reference to compound harness weave. The satin weave in this instance is to be selected for lowering the warp threads from the upper plane to the

lower plane of the shed, and the plain weave for raising its respective warp threads from the lower to the upper plane of the shed. Since each set of compound harnesses is in this instance working independent, no combination weave is required to be shown. However said weaves must be arranged so that no meeting of points in one square can occur, since any warp thread only can be in one plane of the shed, and should two of the points in weaves 31 and 32 meet, trouble would occur, since in this instance either set of harness would try to claim the thread. This affair will be readily understood by the reader, and when he carefully will examine weaves Figs. 31 and 32 and when he will find that where there is an indication in one of the weaves, there is no indication in the other weave, and vice versa, or in other words, the two weaves are selected in their proper posi-

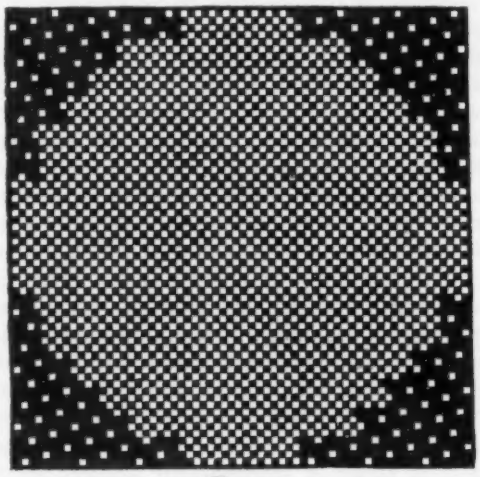


Fig. 33

tion. Changing, for instance, the plain weave as now on the same squares of the designing paper to the reverse effect would naturally be an imperfect combination, a feature readily understood.

Diagram Fig. 33 shows the interlacing of a portion of a fabric, corresponding in its general figure to the previously given diagrams. In this instance the ground is woven on the 8 leaf satin, the figure on the plain weave, the affair calling for 12 compound harnesses. However, it must be understood that either the ground of the figure can refer to one or the other weave just as the case may require, and for which reason we have given,

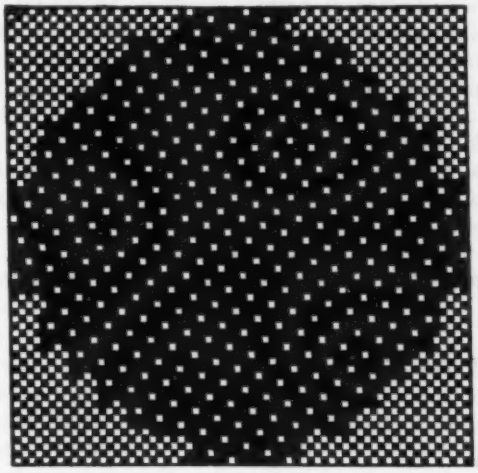
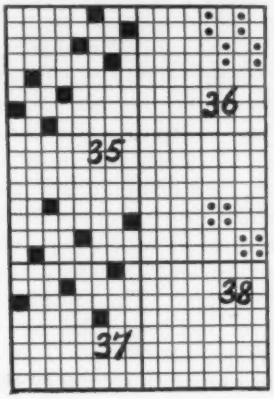


Fig. 34

in connection with diagram 34, the reverse effect in a fabric, i. e., the figure satin effect, the ground plain. Which weave to use for one or the other effect—ground or figure effect—depends entirely on the character of the fabric under operation. This combination of 2 weaves finds extensive use in the silk industry, fabrics of this kind being styled crepe



de chine, since in connection with these fabrics, an uneven face is no objection, in fact required.

In connection with weaves Figs. 35 to 38 we gave two examples for combination for

the present class of fabrics, i. e., weave Fig. 35 shows an irregular "spotted" 8 harness weave. Weave Fig. 36 $^{2}\!\!-_{2}$ warp rib Both weaves are in perfect position, as shown, i. e., risers in one weave will meet sinkers in the other weave, and vice versa, thus being in a position for practical use.

Weave Fig. 37 shows us the 8 leaf satin for one effect, to be used in connection with weave Fig. 38, the 4 harness basket. Both weaves are also shown in proper relation to each other for perfect work on the loom.

PRACTICAL POINTS ON WOOL GRADING AND SORTING.

The wool after being shorn from the sheep at the ranch or farm, as the case may be, is next folded and rolled up, each fleece in a package and tied up with a string in order to make further handling handier, any number of these fleeces being then placed in a large sack and in this manner reach either the commission merchants in the East (Boston being the wool centre) or the larger mills that send out their own wool buyers direct.

PUTTING UP OF WOOL FOR MARKET.

In the putting up of wool for market, there has long been a cause of variance and friction between grower and buyer in all parts of the country. The buyer complains of filthy tags and dirt in the fleeces, and of the use of unnecessary quantities of unreasonably large twine of a fibrous quality that injures the fabric in the manufacture by means of these vegetable jute, hemp or waste fibres of every description intermingling with the wool fibres, and in turn being directly the cause of an unnecessary amount of specks in the fabrics, the removal of which requires time and labor and consequently means extra expenses to the manufacturer. The same also refers to the quality of bagging used by the sheep raiser in packing the fleeces. On the other hand, growers say that when they exercise the greatest care in all these respects the buyers will allow no discrimination in price. There is doubtless some truth in these countercharges, yet a lot of fleeces carefully handled, of even quality, would claim some consideration from a practical buyer, or they could be sent to a reliable commission house and command a price that would pay well for the extra care.

The advisability of washing sheep before shearing has long been a subject for discussion. Its purpose is the better condition and higher price of the wool. The difficulty presented, which appears to be insuperable, is in obtaining a uniform condition of cleanliness. Necessarily some flocks have more foreign matter in their fleeces than others; there is always great difference in the amount of yolk or grease which the ordinary washing does not affect. Facilities for washing are very poor on many farms and ranches, and different methods of washing are very unequal in their results. If a grower is not inclined to be exactly square in his dealings, or if his perceptions of strict honesty are a little confused by the unfairness of buyers in making no discrimination as to degrees of cleanness in buying, he may slight the process or drive the flock through muddy water. Altogether most flock raisers prefer not to wash, and nearly all dealers unite in a preference for unwashed wools. They find so much unevenness that. in buying washed wool, they usually make some deduction from established washed rates, and in some cases pay little more than for unwashed. It is said that much of the country washing is a positive disadvantage in scouring the wool. Therefore the practice of washing is declining; in many districts it has been almost abandoned. There are many of these scouring-mill plants, even as far west as New Mexico. The saving of the freight on the grease and dirt certainly should be a large item in favor of sending only scoured wool (the same of course being only partly scoured wool to the manufacturer for his mill) East.

GRADING.

In some instances the fleeces are graded, for one reason or the other, by the commission merchant, but no matter from which source they reach the mill, when arriving there, each and every fleece is graded properly by a competent expert employed by the mill for this purpose, before the fleeces reach the wool sorter. This is done by the mill for the fact that there is no standard or basis or fast rule of grading, and in the nature of wool

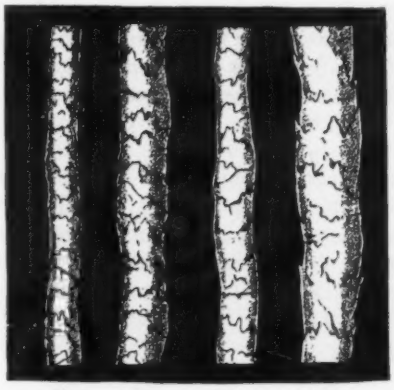
there never can be. Persons may have what they call a standard grade, but such a standard will be merely an understanding of these people among themselves. For example, what one or more graders might only call a 1/2 blood, other equally competent graders might term a low 3/4 blood, etc. Certainly with reference to pronounced fleeces, i. e., full grades, no two expert graders would differ, all disputes regarding fleeces chiefly arising when dealing with what are termed "liners," being fleeces which more or less fall between grades, and which one expert might class with the higher and the other with the lower grade. Every mill has its own idea of grades, and it is therefore particular to have its purchases examined by its own grader, in order to be sure that the wool is graded as desired by them.

Sorting and grading are, in smaller mills, frequently done by one person, but in large mills, especially those large and prominent woolen and worsted mills where wool sorting is not only required but at the same time its value understood, and where division of labor can be profitably made, one person (or two if the mill is very large) grades the fleeces which several others in turn sort. Grading the wool consists in separating a lot of fleeces into various grades, according to the fineness or coarseness of the fibre, and sometimes according to the length of the staple, and this refers to possibly thousands and thousands of fleeces in a certain lot of wool bought by the mill; whereas sorting consists in taking the fleece and separating the finer and coarser parts. It will be readily understood that fleeces graded by an expert in a mill will certainly simplify the work of the sorters considerably, besides resulting in more wool sorted in a given time by each sorter.

SORTING.

The sorter's work is one requiring constant care, a quick eye, and good judgment, which can only come from long experience. To the uninitiated he appears to work without thought, but there is no work requiring more care, especially in mills whose product is yarn which it is desirable to have of a constant uniform grade. Before explaining the procedure of sorting, it will be in its place to refer to the object of sorting which finds its necessity in the fact that wool not only varies in quality with different animals, but also on one and the same sheep. The character of the breed and the pasturage that is afforded to the animals have an important bearing on the wool fibres of commerce and the structural characteristics of wool produced on the different parts of the body. The uniformity of length and of diameter, and the number of scales per inch, vary in different individuals, even among the same breed of sheep. The best is that from the shoulders, the lower part of the neck, the back and the upper part of the sides, while that which covers the head, breech, tail, belly and legs is of an inferior quality.

To illustrate the influence of taking care or not of sheep, as well as the variation in fibres on the same sheep, the accompanying illustrations are given, representing:



A B C D

A.—A specimen of fibre taken from the shoulder of a sheep which had proper care;

B.—A specimen of fibre taken from the breech of the same fleece as fibre A was taken from;

C.—A specimen of fibre taken from the shoulder of a sheep of the same class from which fibres A and B had been taken but where the animal was poorly bred, i. e., neglected;

D.—A specimen of fibres taken from the breech of the same fleece as fibre C was taken.

In some mills, making an average class of fabrics, grading or sorting or both is omitted, the mill in this case running on one or pos-

sibly two standard qualities of yarn only, and where they rely on the judgment of the commission merchant, with reference to a lot of wool, for their wants, from which it will be seen that by such mills the services of a grader or sorter are not required.

The first task for the sorter when the fleeces reach him from the grader, is to open the first fleece, i. e., undo the strings placed by the wool grower about the fleece, in order to keep the latter compact by itself in the wool bag. The grader was not compelled to cut this string for the reason that he has been able to determine the grade by pulling out bits of staple here and there from the fleece, thus averaging the whole fleece. After the strings are removed, the fleece is shaken out by the sorter on his sorting table, thus separating from the whole fleece any loose pieces of wool, called "locks," as well as bits of short, coarse, and dirty wool, as are occasionally rolled up inside the fleece and which are called "stuffings." These droppings from the fleece must in turn be separately sorted, since coarse and fine fibres are apt to be mixed up together.

The fleece is now spread out by the sorter on his table, so that he can readily separate the coarser and finer parts from the fleece.

Before explaining and illustrating sorting proper, it is not out of place to refer to what is known as "clips," or rejections, and which are portions of wool which must be treated entirely different in the mill than the other wool of the fleece. By clips we refer to portions of wool heavily contaminated with burrs, or hardened paint, tar or hard lumps of manure; or to possibly be badly, perhaps irremediably stained. The sorter then clips off the wool containing such hard bits of paint, tar, and hard lumps of manure, and tears out any irremediably stained portions as well as such filled with burrs not easily removable, and puts these various clippings in a sort by themselves, since such wool has to be treated differently during scouring and picking than the wool from the rest of the fleece. It must be mentioned here that the amount of these clippings varies considerably with certain lots of wool, fine, high priced and consequently carefully raised wool having little, if any, whereas in connection with cheap grades of wool, carelessly raised, these clippings are of considerable proportion, and consequently increase the cost of such a lot of wool to the mill.

(To be continued.)

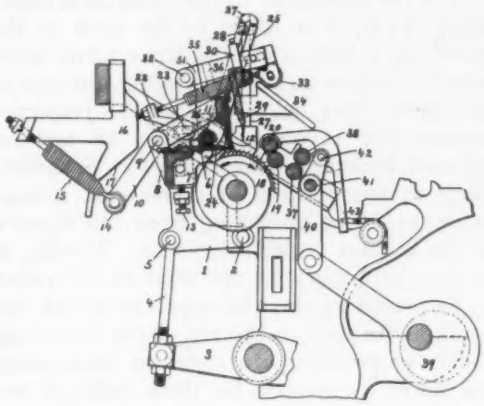
THE NASMITH COMBER.

The general principle of this machine is closely related to that of the Alsatian comber, the chief point of similarity being that the feed roll, nippers and top comb are carried on a swinging frame, which is used in connection with the attaching operation. The various methods of obtaining the different operations of the several mechanisms on the machine, vary from those on the Alsatian comber and are best explained by means of the accompanying illustration, which is a cross sectional view through the machine, showing the positions that the parts occupy when the swinging frame is stationary and at its greatest distance from the detaching rolls. The different mechanisms on the machine will be taken up in regular order for clearness as to the working of the machine.

THE NIPPER FRAME AND PLATES.

The nipper frame 1, of which there is one at either end of the head, the two forming a pair, is pivoted on a fixed stud 2, and on which it oscillates, said stud being carried on the framing of the machine. These nipper frames receive an oscillating motion from an eccentric through a lever 3 and connecting rod 4, proper slots being provided in the frame for setting the stud 5, so as to vary the movement of the frame when desired. The bottom nipper plate 6, which is adjustable in a horizontal direction, is secured to the swing frame1, by being carried by a bridge 7, which is screwed to said frame. Cast on the swing frame 1, and near each end of the bridge 7 is an arm 8, carrying a stud 9, on which are pivoted the moveable arms 10, which are united by being cast together with the transverse bar 11, to which is screwed the top nipper plate 12. The whole nipper can be adjusted to the proper distance from the needles by a set screw 13. The lower extremities of these nipper arms carry rollers 14, and projections onto which are hooked the

springs 15, whose outer ends pivot on arms of the bracket 16, as bolted to the back bar, the lower part of said bracket 16 having an inclined face 17 against which the roller 14 rests when being oscillated with the swing frame 1, and is thus forced to deviate from its arc, which action, through the pivot 9, opens the top nipper. Bracket 16 is adjustable in the vertical direction, and consequently the time when the nipper commences to open can be regulated. The path of the nipper in its passage from the combing position shown in the illustration, to the detaching rollers is almost a direct line and departs as little as possible from the periphery of the combing cylinder 18, whose smooth surface, a little beyond the last row of needles, rises as high or even a little higher than the points of the needles, so that it supports the projecting tuft in revolving rapidly below it, and immediately the nipper opens, helps to direct



the tips of the fibres of the tuft exactly to the nip of the detaching rollers 19 and 20 on the one hand, while it also strokes the tail ends of the returned fibres gently below the bottom detaching roller 19. By thus keeping the path of the nipper close to the periphery of the cylinder an absolutely perfect piecing may be made from the simple motions of the nipper, cylinder, and detaching rollers combined.

THE FEED ROLLER.

The feed roll 21 is carried by one end of a lever 22 as pivoted at 23, the other end of said lever 22 being spring controlled to keep the feed roll against the plate 6. The lever 22 can be adjusted in a horizontal slot, so that the distance of the roller from the top nipper plate 12 (and consequently from the nipping point of the detaching rollers 19 and 20 during the separation) can be regulated to suit the length of the fibres to be combed. The easy adjustment of this distance is of great importance, as it effects the quantity of waste made, and the distance of the feed roller from the detaching roller, when at the nearest point, must only slightly exceed the length of the longest fibres. Fixed on the end of the feed roller 21 is a ratched wheel 24 with fine teeth, and freely pivoted on the boss of this wheel is a lever 25, slotted for the greater part of its length and carrying pawl 26. The pawl actuates the ratchet by having a vertical rod 27 fixed to the framing of the machine, and on which rod is an adjustable pin 28 to engage in the slot of the lever 25, and as the swing frame moves forward the nip of the detaching roller, said pin prevents the forward movement of the lever at the point where it engages in the slot and thus causes the pawl to turn the ratchet. The vertical distance of the pin from the feed roller determines the number of teeth taken at one oscillation, and the position of the verticle rod 27 in relation to the arc of oscillation of the feed roller is such that the feed is greater the nearer the feed roller moves towards the detaching rollers. The detaching rollers 19 and 20 draw their supply principally from the bodily advance of the tuft projecting from the nippers, but they also obtain a supply due to the turning of the feed roller while said detaching rollers are turning forward. The feed roller is not brought up to a position in front of the detaching rollers and allowed to dwell there, only turning a little while the detaching rollers are drawing their supply, but it is carried bodily forward directly toward the nip of the detaching rollers, while at the same time it continues its feed by a partial revolution. There is, therefore, during the time the detaching rollers are turning forward, a double supply fed, due to the continued revolution and bodily advance of the feed roller.

THE TOP COMB.

The top comb 29 is carried on the trans-

verse bar 30, bolted at either end to a top comb arm 31, as pivoted on the stud 32, fixed to the frame 1. The transverse bar 30 can be adjusted horizontally on the arm 31, and the angle may also be varied within the necessary limits. The arm 31 carries at its outer end a roller 33 which runs during a part of the oscillation on a guide plate 34, being held against said plate by means of the spring 35. Cast on the arm 31 is a projection 36, carrying a stop screw (not shown), which at the desired moment during the forward movement of the nipper, comes against the frame 1, causing the roller 33 to leave the incline 34, arresting its further descent, so that for the remainder of the oscillation, the top comb point follows a path parallel with that of the nipper. This permits the movement and depth of penetration of the comb to be regulated. The comb will penetrate the fleece gradually and sufficiently without descending too near the cylinder, owing to the fact that the fleece rises as it is drawn straight between the nip of the feed roller and detaching rollers, which straight line is considerably above the path of the nipper, being highest when the nipper is closest to the detaching rollers, owing to the roller 20 rolling on the top of 19 and to the rise of the feed roller and nipper as they approach said rolls. The position of the top comb pivot 32 with relation to the points of the needles is such that the top comb does not fall in a direction parallel to the top nipper plate, but in a direction which approaches nearer to the nipper plate the lower the comb falls, and which approach may be increased by providing a slot in the frame 1 and the top comb arm 31, for the pivot 32. With this arrangement the comb may be caused to enter the tuft well in advance of the front of the nipper and still to be close to the nipper when the latter arrives near the detaching rollers, thus insuring that no part of the tuft shall escape being combed and still no room be lost, the nipper not being prevented by the top comb from approaching as near as required to the detaching rollers.

THE DETACHING MECHANISM.

This motion consists of the two rolls 19 and 20 as previously referred to and also the rolls 37 and 38. The fluted steel rollers 19 and 37 turn in stationary bearings. 38 is also a metal roller resting on roll 36, by its own weight and in stationary guides. The detaching roller 20 is covered with cloth and leather, and receives a special rolling motion over the top of the roller 19, being always in contact with said roller 19. This roll is caused to move from a position slightly in front of an imaginary line drawn vertically through the centre of the roller 19 to one slightly behind that line and back again, by means of an eccentric 39 which imparts to the lever 40, fixed on a shaft 41, a rocking motion, which is imparted to the other end carrying a stud 42, on which pivots freely the lever 43, and consequently oscillates with the stud 42. The roll 20 being held by the arm 43 is kept in contact with roll 19 by having a chain attached to the lower end of said arm 43 with a weight hanging from it. The object of the movement of the roller 20 is threefold. First, it is rolled to the back of the roller 19 so that when the latter turns backward to deliver its tuft for piecing, the tips of the fibres thus delivered shall be projected against the revolving cylinder 18 and be stroked underneath the roller 19. Secondly, while in this position or thereabout, it may seize the fibres projecting from the nippers at the earliest possible moment. Thirdly, it is then withdrawn to the front of the roller 19 to permit as close an approach of the top comb and nipper to the nip of the detaching rollers as possible. In order to draw away the fibres as gripped by these rolls, it becomes necessary to greatly increase the forward motion of said rollers. The method of operating the rolls is similar to that explained for the Heilman comber.

About two-thirds of the total output of the coal tar products comes from Germany, and the value of these manufactures for 1900 was estimated at $36,000,000.

Indigo was first brought from India to Holland in the sixteenth century. Its introduction was strongly opposed by the cultivators of the woad plant and its use was repeatedly prohibited by law.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

LENO CLOTHS.

BY WILL NELSON,
Head Instructor in Warp Preparation and Weaving, Lowell Textile School.

(Continued from July.)

This article will deal with the starting up of a leno warp in the loom. Fig. 1 shows the pattern; it is a net and lace leno stripe with plain ground. Thirteen harness are required, including two sets of doups, one top, the other bottom, so that the cloth may be woven right side up; 4 plain harness; 2 ground and 1 crossing thread harness for the net leno; 1 ground and one crossing thread harness for the lace leno. Owing to the difference in the amount of take up in the warp, three warps are required.

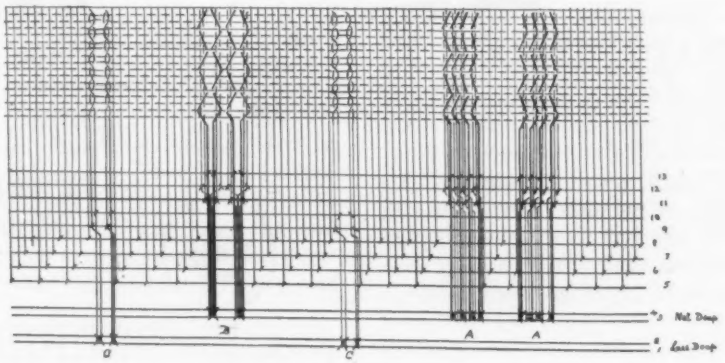


FIG. 1.

Fig. 2 represents the harness and warp in the loom. A is the net leno warp; B, the lace leno warp; C, the warp for the body of the cloth. There are several reasons why we have placed the net leno warp on the outside: first, this yarn, 2/20's, is the coarsest, and as the outside threads are apt to be rubbed by the weaver's passing behind the way, it is better to have the coarsest rubbed for they have little tendency to cling together. If the yarn on B was rubbed, the threads would cling together and break out when the twists neared the lease rods or heddles; second, the ground threads for the lace leno come from the same warp as the crossing threads, and it is necessary to have them pass around a standard or stationary rod. This rod is invariably on the inside so that it saves additional crossing of the thread. A glance at Fig. 2 D will show this. When the harness are placed in the loom it is better to set them straight before the springs are attached. Set the plain harness so that the yarn is resting on the race plate. When the filling has been placed in the shed, the bottom shed will be raised up almost one-eighth of an inch. Set the standard harness a trifle lower than these, so that when the doups are changing, what little slack there may be in the doup will be below the yarn in the body harness. Set the 10th harness a trifle higher than the 5th, 6th, 7th, 8th and 9th, the 11th and 12th corresponding with the body harness and the 13th a trifle lower. The 10th is higher than the rest because it is the crossing thread harness for the lace leno which is a bottom doup, and this

harness has to be higher to obtain a clear shed with doup at the front. The net leno being a top doup, the crossing thread harness, 13, has to be a trifle lower to pull down the heavy card thread on the race plate.

The next thing in order is to adjust the

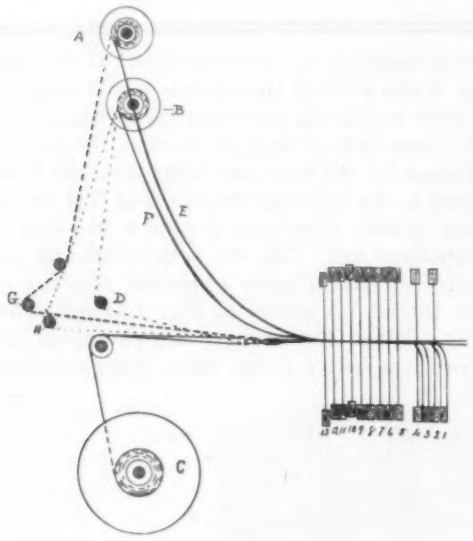


FIG. 2.

easing rods. Figs. 2, 3 and 4 show how this is accomplished. The lines marked E, F, Fig. 2, show the original position of the yarn before the rods are fixed. Two easing rods and one standard, G, H, D, are necessary.

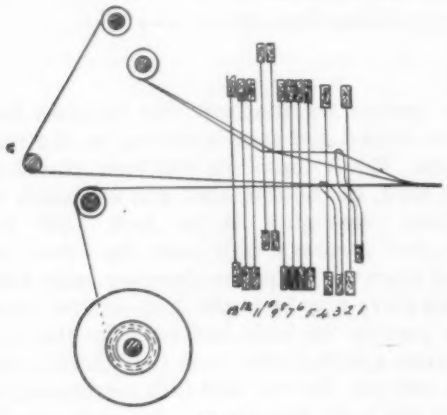


FIG. 3.

To fix the outside rod, which is the net leno easer, the 9th and 10th harness are raised to lift all the yarn for the lace leno out of the way. The rod, G, is then fixed in place. To place the easing rod H, Fig. 4, the coarse yarn in harness 13 is raised out of the way and the crossing thread harness 10 is lowered, but the ground harness 9 is kept up. Two wooden rods are inserted between this yarn, by means of which the threads are separated. The easing rod is then placed in the position shown.

To fix the standard rod drop all the harness, and place the rod in position shown, D, Fig. 2. Care must be exercised when placing the easing rods to keep the yarn as straight as possible. Carelessness at this time often spoils several yards of cloth and causes loss

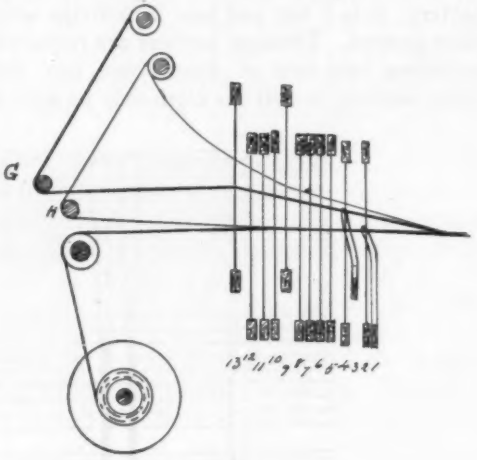


FIG. 4.

of time and the constant changing of the setting of the harness. This is by reason of the fact that if the threads are twisted and snarled as soon as they are twisted, some of them will be loose and will not run right. Sometimes on complicated patterns where three and four doups are used, the leader or apron is tied in two or three times to prevent the twisting and snarling of the yarn, but generally if care is exercised once is sufficient.

After the apron is tied in the lease rods are placed in position, but a little advice as to the tying in of the apron may not be out of place. It is far better to tie to the leader a small bunch of ends, say about two or two and a half inches in the reed, than a greater num-

ber, for the warp will start up better and a less length of yarn is wasted, especially is this so on fine work. Start with just enough to go in the temple and no more, for those outside the temple will not be as tight as those inside, with the result that the filling will curl in that part of the cloth. The slack yarn in fancies will not be taken up as in plain cloth. A glance at Fig. 5 will show one reason why. A is the narrow portion, B is the wide portion. When lifting the harness for the lease rods always have the crossing threads over the back rod; this is because the yarn has to pass under one rod only, and

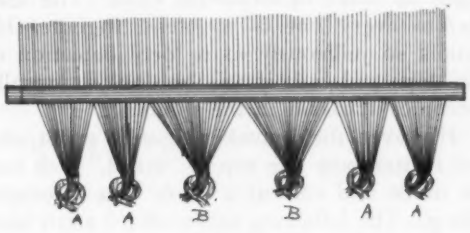


FIG. 5.

when slackened by the easer the slack yarn will be nearer the harness where it is required, than if the yarn passed under the back rod and over the inside rod. Then the slackened yarn has a tendency to remain between the rods. Lift the other harness over the back rod to correspond with the second and fourth of the plain. The dotted lines, Fig. 2, indi-

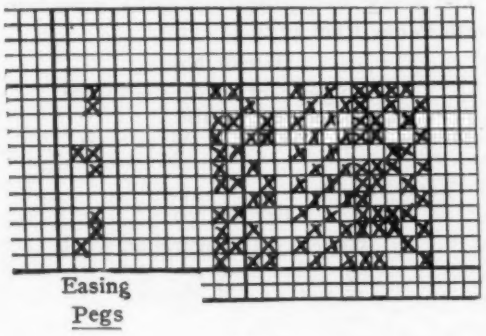


FIG. 6.

cate how the yarn should be when the easing rods, standard, and lease rods are in the right position.

Set the loops of the doup to rest easily in the eye of the standard, attach the jumper to the ground thread harness, 9, and the half motion or double yoke as described in the last article. Fix the heddle rods to the hook. More than one smash has been made through neglect to attend to this vital point. Peg the chain from the plan, Fig. 6. Adjust the weights according to judgment and the loom is ready for a few picks of filling. Never start the loom with power until a part or all of the pattern has been tried by hand, for there may be a peg wrong or the doups require a slight change. Either may have caused a smash if the power had been applied. With something set wrong a few picks are sufficient to strain the doups. When the doups are once strained, it is impossible to get them to work right afterwards. You cannot fool with a leno with impunity.

TOPMAKING.

The art of topmaking would seem to have reached the limit of its excellence; it is difficult to see how any new developments are to be forthcoming to cheapen production. Nevertheless it is the constant study of scores of topmakers how to produce tops at 1/8d. per lb. cheaper. From 1875 to 1889 the trade was fairly profitable, but since then the work has got considerably worse, until today it is a very keen struggle to make ends tie. The greatest "plunder" in the game is when a man has a fair amount of raw material and there comes a rise; but, given ordinary conditions, the difficulty is very pronounced, and not a few have lost their all in the business.

If it were possible simply to buy (say) Australian wool, comb it straight away just as it is, and thereupon be able to command a reasonable profit, topmaking would be a veritable Eldorado. As it is, however, the topmaker's way is strewn with difficulties and pitfalls. These are days in which topmakers strive to produce a "cheap" top; and, no matter what it is like, if it can be produced and sold at a profit they are satisfied.

As already said, a great deal today hinges around the price of the article, and in the clamor for something cheap, quality and character are being relegated to a secondary position. This may serve the purpose at the

time, but it is questionable if in the long run it is good policy.

We are now dealing specifically with merino tops, but the same principle of mixing holds good in the production of crossbreds. In making the latter the three descriptions of wool most generally used are New Zealand, River Plate, and English; while in producing a merino top, Australian, South African, and Buenos Ayres, which represents Argentina and Uruguay wools, form standard mixings.

Now in producing a merino top, a pure Australian combing is the standard to go by; and what topmakers are striving to do is to mix the wools of the three countries so deftly as to produce a top showing as good a quality, color and handle as is found in a pure Australian top. The nearer that is done, the more perfect the mixing. Now in preparing a blend of wool for such a top, there must of necessity be a certain percentage of Australian wool which shall entirely neutralize the effect of any other wool used in the blend.

Buenos Ayres, skin, and South African wools produce tops hardly equal to the pure Australian in style, character, and spinning quality. A merino top made out of South American and even skin wool is always more hard and harsh than the Australian top, while a spinner will not pay for a Cape top within one penny per pound what he will for an Australian. It is well known that only in exceptional cases will a buyer pay the same equivalent value for any merino wool that he will for the wools grown in Australia or New Zealand—simply because he knows that such a wool will spin neither so well nor so cheaply.

At the same time experience has shown that Western Cape wools possess characteristics very little inferior to Australian, and these are popular favorites with topmakers. Some think that the handle of Western Capes is as good as Australian; and, while they are certainly fast approaching the latter on that score, the color is equally good; and as to the spinning property, there is not much to complain about. Topmakers object to lustre in fine tops, it being in crossbreds that men look for lustre and brightness; and the Western Capes possess that dead color so essential to merinos.

Eastern Capes are not nearly so smart as Western Capes, and these are largely mixed with Australians, along with Buenos Ayres, to produce a good 60's top of an average standard. By adopting these methods, Bradford topmakers this last few years have been able to meet spinner's demands for a Botany top that has enabled them to produce a yarn to meet a popular call.

It is impossible to lay down any hard or fast rule, for every topmaker pursues his own course, and mixes together various percentages in order to attain his ends. The idea before every one is to blend together his wools so judicously as to defy detection in the top; and even if this be done, it usually becomes apparent in the spinning.

However, the topmaker's goal is profit, and no matter how the top is "faked," if it can be made and sold at a profit that is everything. The following tables afford a fair idea of the percentages of the various kinds of wool that go to make up different blends; and as these are taken from actual experience, they will give our readers an insight into the operations of a Yorkshire topmaker.

BLEND NO. 1.

60	per cent.	Australian wool.
40	"	B. Ayres "
Total 100		

The above will produce a fairly good top, worth to-day from 47 to 48 cents.

BLEND NO. 2.

60	per cent.	Australian wool.
25	"	Cape "
15	"	B. Ayres "
Total 100		

BLEND NO. 3.

50	per cent.	Australian wool.
25	"	Cape "
25	"	B. Ayres "
Total 100		

BLEND NO. 4.

50	per cent.	Australian wool.
28	"	Cape "
22	"	B. Ayres "
Total 100		

When all is said and done, such a mixing of wools will not produce so satisfactory a top as one made out of the genuine article; and a top made out of Australian, South African, or Argentine wool should be sold on its intrinsic merits, without any "gillery" being attempted.—The Textile Mercury.

LOOP EFFECTS.

BY J. H.

(Copyright, 1904, by Lord & Nagle Co.)

It is always interesting to the designer and to every one connected with the manufacture of fancy fabrics, to know the facts connected with the origin of any effect which deserves to be classed as a novelty, which, I think, the loop effect certainly was. About the year 1889 there arrived at the office of one of the best weaving establishments in Lancashire, England, a batch of clippings composed of Swiss laces, French ribbon, etc. It was my duty to make selections from these. Among them was a small piece of ribbon with a leno stripe down each side and in the centre was run a thread on which were placed glass beads at intervals of about three-eighths of an inch as shown at Fig. 1. To fix glass

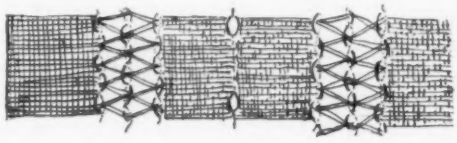


FIG. 1.

beads in such a position was out of the question so far as the power loom was concerned, but it suggested the idea of throwing a loop upon the cloth and thus producing an effect which would be novel and acceptable to the market. The loop effect seemed to be premature, for it was several years before it came into use. Time, however, made it very apparent that this loop effect was very acceptable and it was used in a variety of combinations and is yet capable of extension.

There have been two methods used in producing this effect. One consists in using a special drawing-in draft, the other in using a reed motion which causes the reed to fall out and back into position in the manner used in making terrys, the reed motion being operated only when making the loop. The

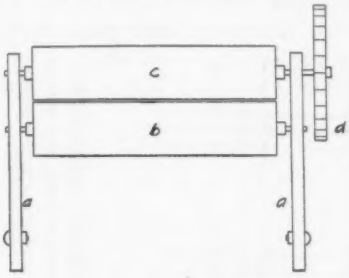


FIG. 2. FIG. 5.

apparatus for placing the reed in and out of position is very simple and any mechanical

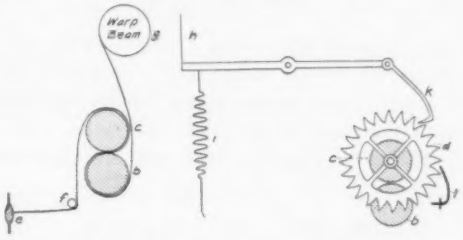


FIG. 3. FIG. 4.

device to accomplish that purpose will answer. It is unnecessary to give an illustration of this apparatus because the loop effect can be produced without it when using the

LOOP EFFECT ON CLOTH.

special draft and with better results. When the reed is pulled out of position for the purpose of bringing up the loop a weak place is made as the filling does not find its place so well afterward. This weakness detracts from the appearance of the fabric and is most pronounced when the loop effect is combined with a leno. I have made this effect with and without the reed motion and, therefore, I discard the reed motion and use the special drafting.

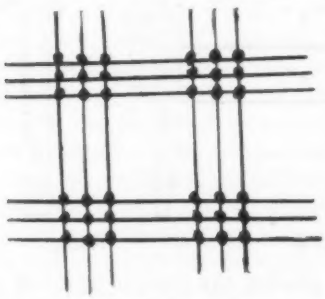


FIG. 6.

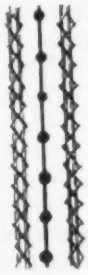


FIG. 7.

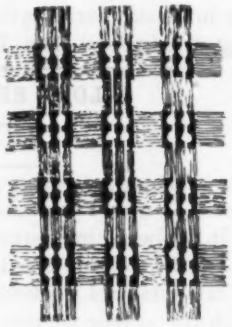


FIG. 8.

Figs. 2 to 5 illustrate this apparatus for regulating the size of the loop required. Fig. 2 illustrates rollers fixed in the loom; Fig. 3 illustrates yarn passing from warp through the rollers to the harness; Fig. 4 shows the lever attached to the dobby to operate the rollers; Fig. 5 is the bracket on each side of a loom to hold the rollers. The various parts are indicated as follows: a, bracket holding

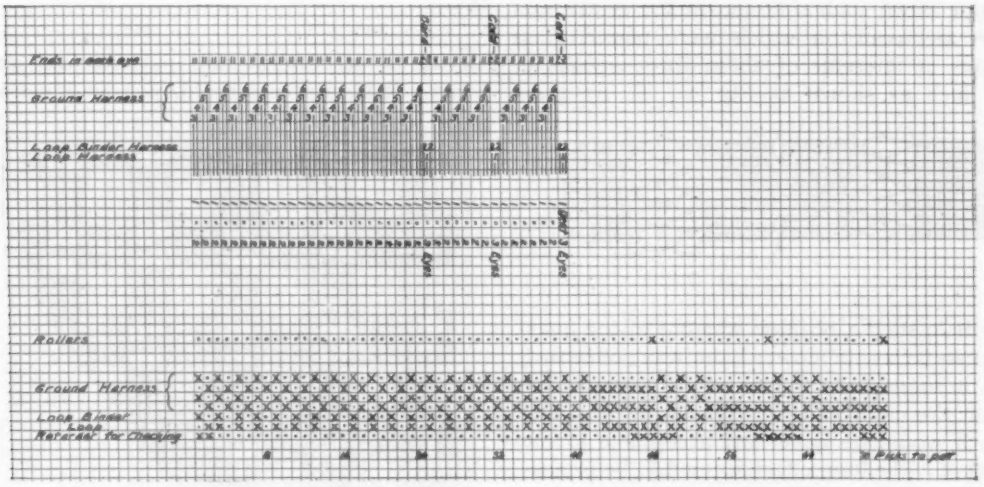


FIG. 9.

In order to make the loops even and regular it is necessary to use a delivery motion which consists of a pair of rollers, say about 2 3/4 inches in diameter, placed behind the loom and above the whip roll, and low enough for the loop yarn to be delivered to the harness with as little interference as possible.

rollers; b, bottom roller; c, top roller; d, ratchet wheel for turning the rollers; e, harness; f, rod for warp yarn to pass under when coming from rollers; g, warp beam; h, dobby connections; i, spring to bring the lever to position when released by the dobby; j, lever

attached to the dobby; k, catch; l, flat spring to hold the wheel when out of operation.

A soft ply yarn is best to use for the loop yarn. Figs. 5, 6, and 7 are three styles with this loop effect. Fig. 8 shows the drawing-in draft and pegging plan for Fig. 5; Fig. 9, those for Fig. 6.

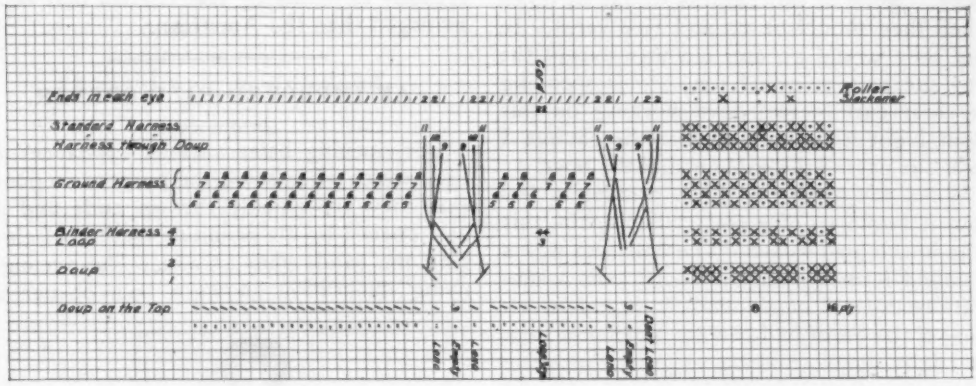


FIG. 10.

The wires should not be drawn from the reed. This has often been done and caused a failure in making the loops. The special drafting consists in having the loop thread between two eyes, working the same and all in one dent as shown.

Wool Spinning Frame. Yorkshire Wool Spinning Machine Co., Cleckheaton, England. A machine for spinning wool on a stationary frame and designed to combine the principles of both the mule and the ordinary ring frame. The roving is delivered to the twisting device and the second pair of delivery rolls intermittently. The twisting device is operated at variable speed to duplicate the twisting action of the ordinary mule spindle. The second pair of rollers delivers the yarn to the ring spindle which winds and imparts additional twist to the yarn. The space between the second pair of rollers and the spindle is the same as that between the first pair and the twisting device so that the twist is uniformly distributed along the thread.

Silk is the simplest, the most perfect, as well as the most highly prized of all textile fibres.

CRANKY LOOMS.

BY DAN READY.

Soon after starting on the section spoken of in the July number we had a new style come in that had given considerable trouble when weaving the sample. It was a combination weave of fancy stripe and leno on fifteen harness, and once in a while it would make a mispick in the leno. The trouble was not confined to one loom, but extended to every loom in which this particular style was put. Under the glass it looked as if the jumper harness had come up along with the doup harness, thus floating the filling under. Every fixer that had one of these warps was at sea and it was through an accident that the remedy was discovered.

It came about in this way: One of the lease rods became loose from its fastening and worked out a little way. The weaver notified the fixer, who was busy at the time, so the weaver attempted the job himself, and when he started the loom it went all right without any mispick. When the fixer got round he found the loom running all right, and on examining it he found the rods in the reverse way; that is, the yarn that was under the back rod had been over it before. On trying the same experiment on one of the other looms he found he had the right thing. The knowledge was spread and the trouble was all over.

I had no sooner got rid of this trouble than I had another one. I received orders one day

to change a loom from an eight harness fancy to a fourteen harness with a half leno weave in it. The loom had been running for a number of years on this particular eight harness weave and the dobby had become set to one regular order of working so that when a change was made there was trouble right away. Some of the harness would be down when they should be up and vice versa. In fact they would go any old way except the way the pattern called for. After spending the best part of two days working on this loom I got it running so that the sample I took out passed the eagle eye of the boss.

When the loom had been running a few days it began to give me trouble again, this time in the leno weave. The half leno was a diamond formed by a 3 ply cord from a separate beam, and occasionally it would bunch up as if the beam had become slack and then get tight again, making an unsightly line across the cloth. It would weave all right for half a day, sometimes for a whole day, before it would kick up and as I could not be Johnny-on-the-Spot all the time, it made it extremely hard to catch on to what was the cause.

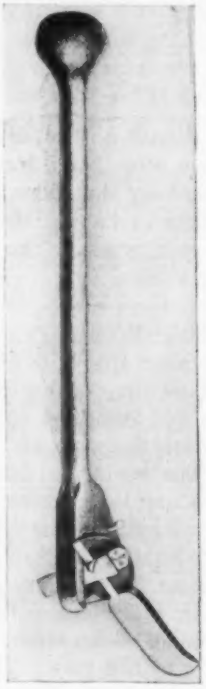
On speculation I put in new latches and uprights all through the leno weave. This included the doup harness, the two crossing thread harness, the doup and the standard and also the easing bar. I also put in two new knives, four hooks and new studs so that there was no play to the knives, thus reducing to a minimum the chances of the latches dropping off.

I also put in a new shedding gear and new studs for the lifting rod so that everything was rigid, yet working easy. Still I had not surmounted the difficulty and I had been working at it a week for I had not done all this at one time, but had done something each time it made a mispick hoping that each move I made would be the right one.

When it had been going on about a week I got on to the cause as I was going by the loom to another job. I saw the cylinder carry the chain a little more than one bar and then fall back again. I had often examined this part of the dobby during the week but had been unable to see anything wrong as it was working on time. After setting the pawl so that it would not pull quite so far I had no more trouble. During the time I was working on this job I often contrasted this mill with the one in England where I learned to weave to the detriment of the former, and in my next paper I will endeavor to show my reasons for thinking the English mill better managed than the American.

AN IMPROVED BALE OPENER.

For opening bales various appliances are used which often serve the purpose so poorly that they are quickly thrown aside and the bale opened by the primitive method of chopping the bands with an axe. The accompanying illustration shows a bale opener recently brought out in Germany which is claimed to be simple, durable and convenient. It is made of steel and withstands the most severe handling. To open the bale the point of the tool is placed behind the band and the



AN IMPROVED BALE OPENER.

lever is then pressed downward and upward. It is claimed that with this tool the bale can be opened quickly and with very little effort; that it separates the band with a clean cut and leaves no portion of the metal in the cotton, also that it opens hard and soft bales with equal facility.—(Translated by the Textile World Record from Oesterreich's Wollen und Leinen Industrie.)

TEXTILES IN YORKSHIRE.

BY S. B. H.

COTTON DRESS GOODS.

I do not know what United States manufacturers think, but I have long expressed surprise at the extensive trade Bradford shipping houses do with American importers in cotton dress goods, fabrics which to say the least should be made to perfection in the land where the raw cotton is produced. It seems an anomalous state of affairs that raw cotton should be grown in the Southern States, freight and rail charges paid across the Atlantic, the same spun into yarns in Lancashire, woven there, and then finally dyed and finished in Yorkshire, ultimately being reshipped back again to New York to be finally worn by the people of the United States. And all this to be done at the expense of a country that boasts of being the home of the cotton industry! A few interesting details arise out of this subject which will interest every reader that handles cotton yarns and fabrics.

I have lately had occasion to go into this subject on behalf of an American client, and the more I have looked into the matter, the more surprised am I at what is transpiring. I cannot even skim the surface in outlining the extensive trade that is done in cotton goods, the styles, shades, widths and weights being legion. However, a Bradford leading export house handed me four samples of a big cotton shipment which they had made this week to New York, and as I looked at the prices and the cloths I was "flabbergasted" at what was being done. I think any expert will agree with me when I say that the samples are well worthy of any United States cotton manufacturer taking a 150-mile trip to see them, for the patterns are exquisite, the prices cheap, and the finish superb. From

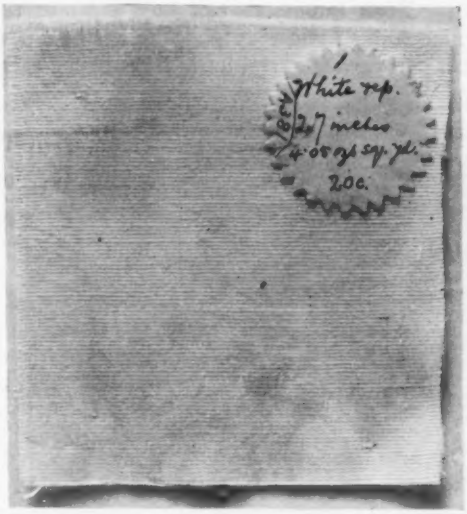


FIG. 1.

these fabrics American cotton manufacturers will be able to gain some idea of what they

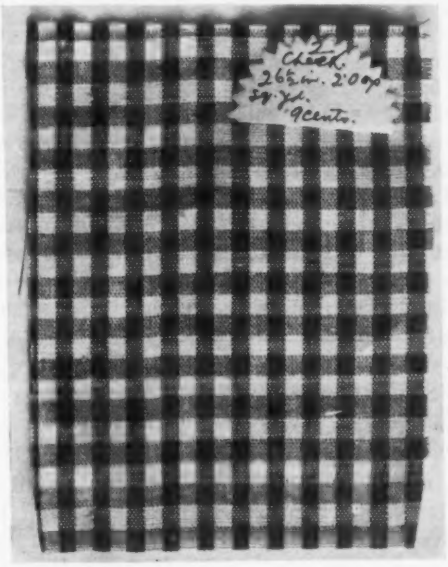


FIG. 2.

have to meet in the markets of India and China. It is no wonder that Lancashire is able to hold the field in the Far East. When

cotton comes down in price the cost of the cloths will correspondingly fall, but when New York importers can buy a white rep which looks almost as good as a silk rep at 20c. per yard it certainly is a "capper" as to

FIG. 3.

what they will be able to purchase next. Let us look at these fabrics, for they are attractive from every standpoint.

Looking through a big pile of patterns, all cotton dress goods which were going forward that week to New York, I selected four sample patterns which I thought specially interesting. The following are detailed particulars:

		Inches.	Square Yard. Ozs.	Cents.
Fig. 1.	White rep	27	4.05	20
" 2.	Black and white check	26½	2.0	9
" 3.	Figured white	27	2.0	9½
" 4.	Figured plaid.....	27	2.94	13

I need not use any space in describing these patterns, the illustrations being sufficient to convey to the reader how they are made. In the two plaids everything of course depends upon the colorings, the one at 9 1/2c. being specially well done by the harmonious blending of colors, the check and colors being very much like a Mackenzie tartan. The figured white pattern looks very smart and very attractive, the figuring being very lustrous and very much as if mercerized yarns had been used to obtain the effect. However, it is the white rep that almost took my breath away; here we have a very smart appearance, and a well made fabric for very little money. Dry goods houses will know better than I what this fabric is used for, but it certainly presents features worthy of being studied. The fabric has a clean cut appearance, and I have seldom seen any smarter cloth at even considerably more money.

In looking at these fabrics there is one thing that strikes me more forcibly than any

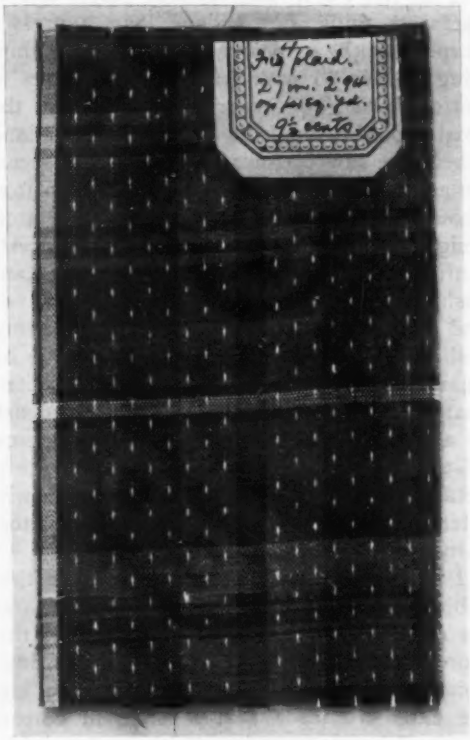


FIG. 4.

other, and I think the finishing of the fabric explains the secret of their successful sale. There is a uniqueness about these cloths which, to say the least, is the predominant feature which will strike any man as he inspects them, and the way they have been got up is highly creditable to Bradford finishers. The white rep especially could be placed in

the hands of any woman and a sense of satisfaction would come over her directly the fabric was put before her. American manufacturers will have to study still more this particular branch of their industry, for it is the opinion of experts on this side that Bradford is reaping quite as much support because of its splendid finishes as from any other characteristic associated with its production of textile fabrics.

[The English samples referred to can be seen at our Boston office. An analysis of the rep gives the following details of construction: Weight 5.18 yards 27 in. wide per pound, 183 ends warp, 42 picks filling per finished inch. Size of yarn as found in finished goods: Warp, 2/87's; filling, 2/47's. Plain weave, the rib effect being produced by the difference in set and size of warp and filling.—Ed.]

A TOO SOLID FOUNDATION.

BY EBEN GOULD.

When I was working at the mills in Blackstone, Mass., about the year 1854, the company put in a large turbine water wheel on which I worked a good deal. It was the largest turbine I had ever seen. The foundations of the mill were built on a ledge of rock through which were cut large passages for the supply of water to furnish the power for driving the mill. The head and fall of water were 35 feet and this gave ample power for all the requirements of the mills.

When the new wheel came the place where it was to stand had to be blasted out of a solid rock. The water was brought from the flume above the wheel by a wrought iron penstock, which was braced in and made as solid as iron and stone could be made. After the stone work had been put in place came the plan for placing the wheel and other connections. At the bottom of the pit was to be placed a heavy iron step fastened into the ledge as firmly as possible to keep the wheel in place. At the top of the wheel shaft was a heavy cast iron girder for holding the top of the shaft. This girder extended across the pit and into the ledge on either side. Across the top of the wheel shaft there was also placed a large spur gear on an upright shaft which was set in a step fastened into the ledge at the side of the wheel pit. This upright shaft was connected with the mill shafting by a pair of heavy bevel gears. The top of the upright was in a box fastened to a large cast iron beam, one end of which was made fast in the basement wall; the other end extended over the wheel and was made fast into the ledge on the other side of the building. The orders had been that all this work must be as solid as iron and stone could be made.

At that time Capt. Pillsbury was master mechanic and was very particular to carry out the wishes of the owner. One day I asked him if he did not think it would be a good plan to put a piece of oak plank under the step of the wheel and also under the upright shaft as well as in all other places between the stone and iron. He wanted to know what earthly use that could be and I told him it would act like a cushion and take off the dead jar that is always found in machinery when stone and iron come together. Without these cushions there was a probability that it would not run a week before there would be a break in some part of the work. Pillsbury told the owners what a bright lad they had and what I said about the cushion and I was well laughed at. They thought I must be a little off my base to think of anything being too solid, but I stuck to my belief and told them that after a few weeks they would be looking for a cushion, both to stop the heavy growling noise and prevent breaks.

I worked at that mill until they got the new turbine ready to run, but the mill was not ready to be connected. The heavy gears were connected and we started the wheel without any other load, and of all the growling any wheel ever made that one took the cake.

Soon after I went to the Maverick mills. A few months later I happened to be in Blackstone and went to see the big turbine wheel. I found that the large spur gear on the top of the wheel shaft was broken in pieces, and they told me it had run only a few days after being connected with the mill before it broke, and that it made a fearful

noise when it did run. They did not give it up, but had a second gear made which lasted about as long as the first one. Then one of the owners, a Scotchman, sent to Scotland and had some Scotch pig iron sent over, and they had a gear made from that, but it broke quicker than either of the others. These gears were quite heavy, weighing about 10,764 pounds.

I did not go to the mills again for more than a year. When I did visit Mr. Pillsbury he said:

"Well, Gould, we are ahead of you this time. The turbine is running fine and we didn't put in any of your cushions either."

I told him the wheel and connections might be running all right, but they had to put in a cushion somewhere to get rid of that grinding jar when the iron and stone came together. When I got to the wheel room I was amused to see the expense they had incurred to avoid doing as I suggested, that is, putting plank between the iron and stone. They had made a skeleton gear in place of the large one and put in wooden lags which had to be one-third wider than the iron one and the upright had to be re-made so as to be of the same width as the wooden lags. This change must have cost about two hundred times as much as it would have cost to put in the plank cushions that I recommended in the first place. I told Pillsbury his plan was all right and that I didn't speak of it before on account of the cost, as the gears were already made, and that the plank cushions would have the same effect as the wooden teeth in the gear.

We once had an old style engine with an old fashioned square frame for a bed piece which was set on a stone ledge, believed to be the best foundation possible. It made considerable noise and could not be made to run still. Later the engine was put in another place where it had fully as large a load, but instead of a stone foundation I made a frame of timber on which I placed the iron bed piece and when it started everyone was surprised to see how still it run.

The eggs of the silk worm are yellow, dry and round, about 16,000 being required to weigh a pound.

MANUFACTURE OF NOVELTY YARN.

BY ERNST SCHULZ, Engineer, Schwelm, Germany.

The April issue of the Textile World Record contained an article by me, taken from the Leipziger Monatschrift fuer Textil-Industrie, on the production of certain kinds of novelty yarn. To complete that article I will now give a description of the machines required for making other kinds of novelty yarn.

The invention of fancy yarn is due not to any one man, but to the efforts of a large number, and like so many other discoveries

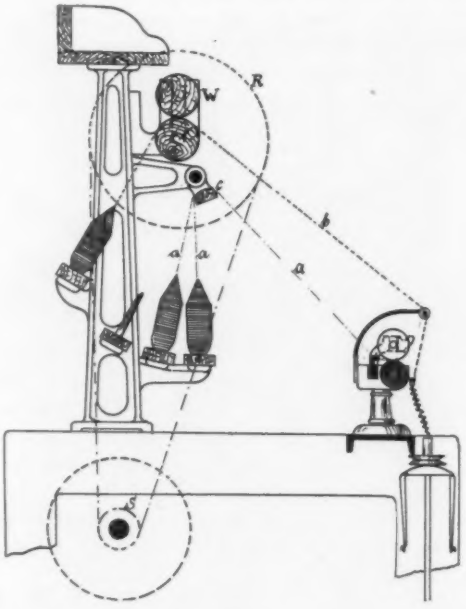
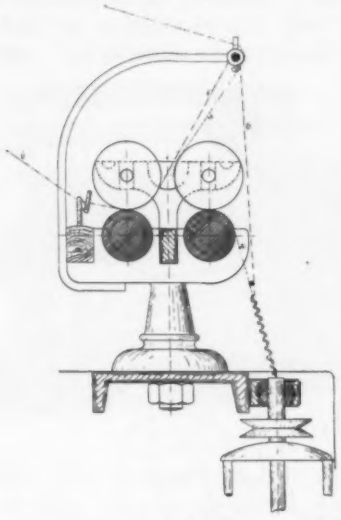


FIG. I.

was originally the result of chance. Probably the first novelty thread was made by the accidental twisting together of two single threads running at different speeds, and then it occurred to some intelligent man to construct a device for making this yarn in large quantities. After that the desire of manufacturers to produce new patterns with the fancy yarn would naturally lead to a development of the art. This process of development led to the production of a large quantity of yarn before the first novelty yarn device was made by a machine builder. The first to manufacture

novelty yarn attachments and twisters were John Sykes, Huddersfield, England, Celestin Martin, Verviers, Belgium, and Ernst Hille, Cottbus, Germany.

Nearly every fancy yarn is made by running two threads together at unequal speed then twisting them by the spindle, and it is not necessary that this difference in speed should be constant. On the contrary, one or both threads may be run at intermittent speed. One thread can be held stationary while the other is moving forward, or one may be broken and the delivery resumed at any desired intermission. Most novelty yarns are made with a ground and a fancy thread. The ground thread usually consists of fine 2-ply yarn; the fancy yarn is much heavier. If the ground and fancy threads are likely to slip on each other during weaving a third thread called a binder is twisted around them in order to hold the fancy thread in position.



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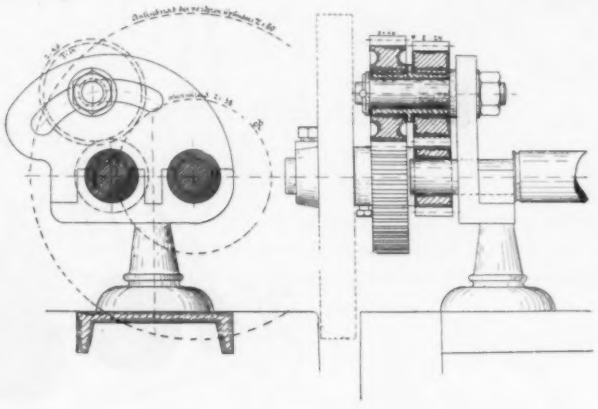


FIG. 3.

FIG. 4.

The first novelty yarn of which we have any record was the spiral made on an ordinary twister. Two ground threads were drawn from mule cops, passed over a cloth covered friction roll which produced a tension. The threads then passed between the delivery rolls. The third thread was drawn from the cops which turned easily on a spindle mounted in porcelain bearings. This thread passed without tension directly to the delivery rolls where it combined with the two ground threads. The greater length of the third thread twisted around the ground threads caused a spiral effect which, however, was very irregular.

The durability of yarn made in this way failed wholly to answer practical requirements. Efforts were at once made to make the yarn more uniform and for this purpose a third thread was run through a pair of positively driven rolls, W, Fig. 1, which delivered a thread, b, at a higher rate of speed than that of the base thread, a. With this

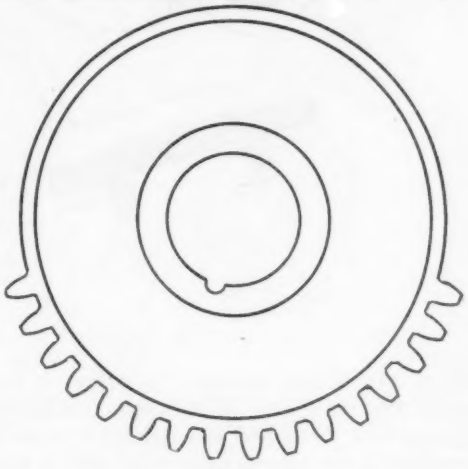


FIG. 5.

addition the first fancy twist machine may be said to have been completed.

These machines were soon built with two sets of rolls only, each set as shown at Figs. 2 to 4. The front roll is driven in the usual way by belts or gears from the main shaft of the machine. Arrangements were made to change the gears so that the rolls could be run at any desired speed. In order to increase the durability of the yarn made on this machine the spiral was twisted a second time, but in the opposite direction with a fine binder thread which often enabled peculiar effects to be produced. The proportionate speeds of the two threads forming the spiral varied from 1 to 1.2 and from 1 to 1.5. Mohair, camel hair and ramie are well suited for the spiral thread.

The range of this machine is necessarily limited to changes in the material, color, twist in the yarn, and relative speed of the base and fancy threads. A wider field was opened up with the production of knotted yarn. The knots can be made in many different forms and in any size desired and at any desired intervals of the thread and in this way any demand of fashion can be supplied. In order to make the knot on the twister the fancy thread must pass slowly upon the base thread for a certain distance and then the speed of the fancy thread must be constantly increased. Numerous devices are used for

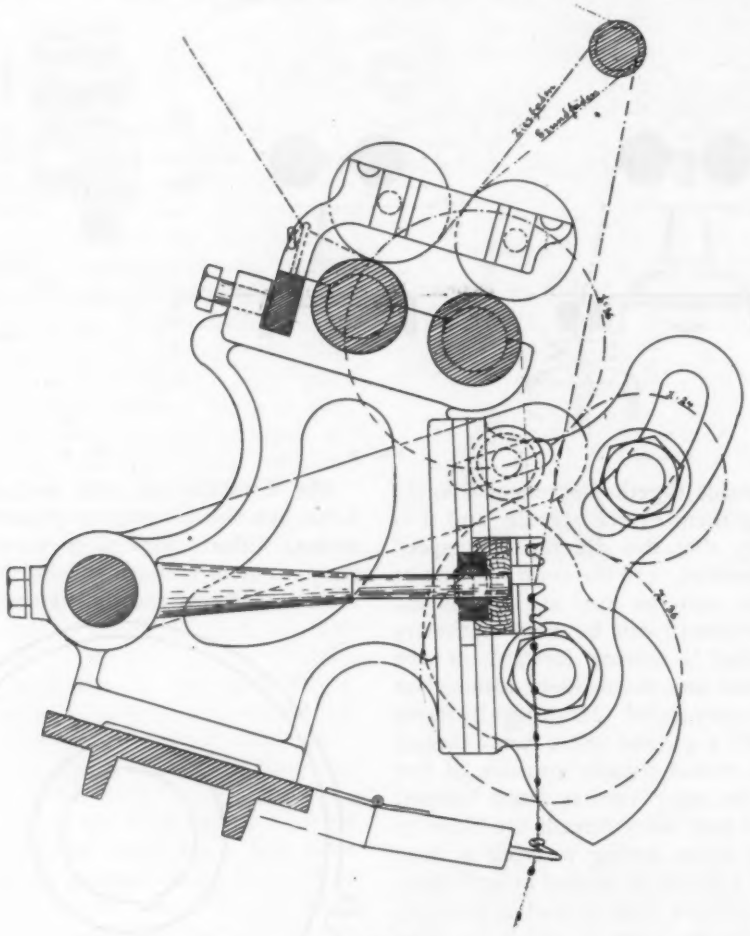


FIG. 6.

obtaining this result. For example, one thread is delivered at a uniform speed by one pair of rolls while the other thread is delivered intermittently. Another way consists in delivering the two threads uninterruptedly at different speeds and passing the fancy thread through the eye of a lever fixed above each spindle. The lever is alternately lowered and

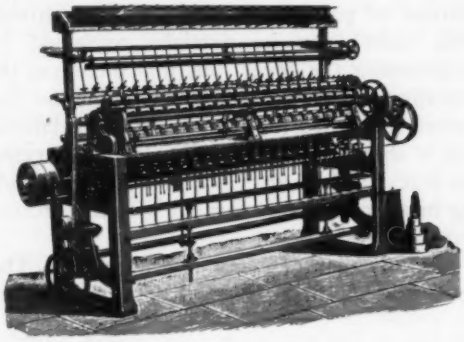


FIG. 7.

raised. The speed at which it passes downward is the same as the speed of the ground thread and during this downward passage the effect is the same as if the ground thread was stationary while the fancy thread was being delivered to it. This causes a knot. The lever is raised quickly and another knot is begun with the next downward passage. In this way the space between the knots is made uniform.

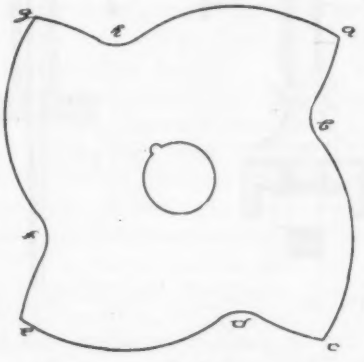


FIG. 8.

In other machines two fancy threads are run on one base thread. Each of the fancy threads passes through the eye of a separate lever. The levers are operated alternately so that a knot of one thread or color alternates with a knot of another thread or color; by adjusting the swing of the levers the knots can be made of different sizes.

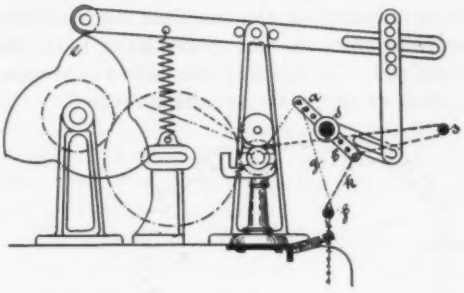


FIG. 9.

The alternate stopping and starting of the ground threads may be effected by the use of cut gears like those shown at Fig. 5, in which

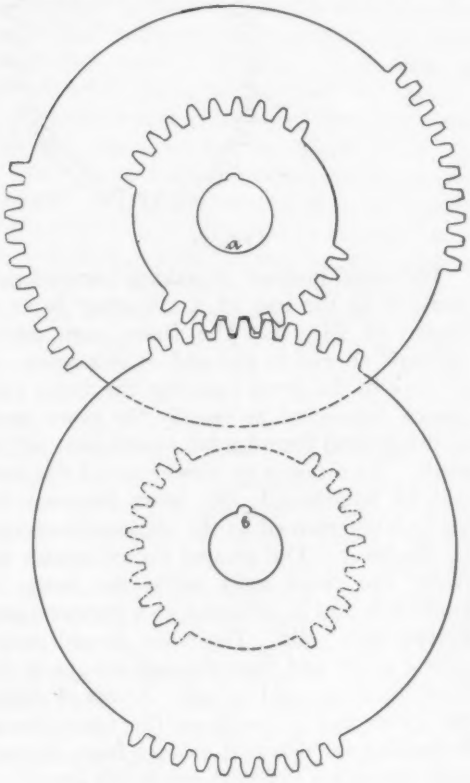


FIG. 10.

the teeth are cut away from a part of the circumference. The fancy thread is delivered continuously. When the ground thread is stopped the fancy thread forms a knot. The

size of the space between the knots can be varied by corresponding changes of the gears. A brake is applied in order to prevent the momentum of the machine from moving the rolls after the cut gears have been disconnected. In this way the rolls are stopped as soon as the gears are disconnected.

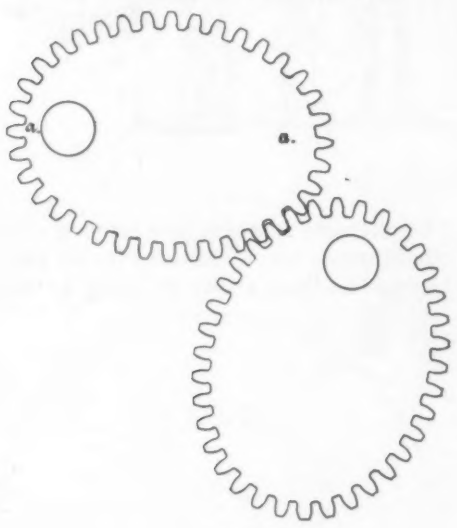


FIG. 11.

The usual method of making knotted yarn consists in the use of a vibrating lever as shown at Fig. 6. The fancy yarn passes through an eye in the end of this lever. If the eye of the lever carrying the fancy yarn passes downward at exactly the same speed as the ground thread a full round knot will be made. By a faster or slower speed the knot will be lengthened; the space between the knots is determined by the distance traversed by the lever. The ground thread passes between the front rolls while the fancy or knotted thread is delivered at a greater speed by the back rolls. The fancy thread passes over a guide and then through an eye in the lever to the ground thread. Knots of different colors can be made on the same thread by passing the different colored fancy threads each through a different eye in the lever.

Many different ways have been employed for vibrating the lever. The downward movement may be caused by the weight of the lever itself. Sometimes this weight is reinforced by springs. The lever is moved upward by cams of which the shape can be varied to suit requirements. The levers are fastened to a shaft running lengthways of the twister and the shaft is vibrated by connecting it with a cam by suitable arms or levers. Most of the vibrating levers have one defect, namely, that the eye through which the fancy thread passes is vibrated in the arc of a circle instead of parallel with the ground thread. This defect can be partially remedied by lengthening the lever, but this increases the vibration which is as objectionable as the curve. A device for remedying both difficulties is shown at Fig. 6. The levers carrying the fancy threads are vibrated by an arm sliding in a straight slot parallel with the ground thread.

Fig. 7 is a cut of a fancy yarn twister. The cams for vibrating the shaft carrying the

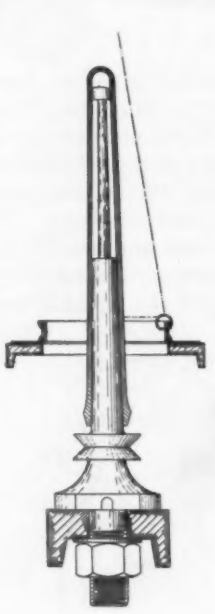


FIG. 12.

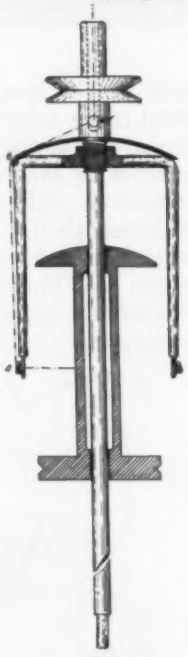


FIG. 13.

lever can be made of wood or iron as preferred. The number of arms on the cam depends upon the space between the knots. Fig. 8 is a 4-arm cam in which the curves bc, de, fg, ha press the levers down while the remaining spaces allow the quick return of the lever. The cam is driven at any desired speed from the front rolls.

Fig. 9 shows a device built by A. Graf in Cottbus, by which it is possible to make knotted yarn with only one set of rolls and a single ground thread. As shown in the illustration, Fig. 9, both the ground and fancy threads are delivered by the same roll. (d) is a swinging shaft which is operated by the cam, e, to which it is connected by suitable levers as shown. At each end of the shaft, d, is fastened a double arm, a b. Each pair of these arms is connected by three wires, running lengthways of the twister and the ends of which are indicated in the illustration. As the shaft, d, swings backward and forward these wires are alternately raised and lowered, the three on the arm, a, moving in the opposite direction to those on the arm, b. The thread, g, passes from the wire, a, to a guide rod, f, where it unites with the fancy or knotted thread, k. This fancy thread is previously passed over the guide rod, s, and then over the outside wire in the lever, b. As the shaft, d, and the levers, a and b, swing back and forth, the threads, g and k, are alternately stretched and slackened, and as a consequence knots are formed when they unite. These knots can be large or small by lengthening or shortening the swing of the arms, a and b. By this method the twist imparted to the yarn by the spindle passes upward only to the rod, f. As both threads are united immediately after they pass the rod, f, there is not the slightest fear that the durability of the yarn will be impaired by reason of their losing their twist.

Although one pair of rolls is sufficient for the production of knotted yarn yet in order to obtain a wider range of fancy effects it is advisable, even with the Graf machine, to employ two pairs of rolls. As before explained, the knots can be lengthened by varying the speed of the levers and in this way cross knots and splash yarn are made. Similar effects can be made on the machine, Figs. 2 to 4, by driving the rolls carrying the fancy thread by gears of peculiar construction, such as the cut gears used for making knots or by the mechanism shown at Fig. 10, which consists of four gears from a part of the circumference of which the teeth have been cut. If gear, a, is a driver it will drive the large gear, b, until the space where the teeth are cut away is reached. At this point the teeth of the large driving gear, a, connect with the teeth of the small driving gear, b. In this way the gear, b, is driven alternately at a low and a high speed. In place of the cut gears elliptical gears may be used, as shown at Fig. 11. The elliptical form has the advantage of passing from low to high speed gradually and thus avoiding the shock and jar incident to cut gears.

The spindle gauge of fancy yarn twisters varies widely according to the class of work to be done. A very wide gauge is used for coarse loop yarn, such as is used in making astrakhan fabrics. Some manufacturers claim that the ring frame is inferior to the flyer frame for making fancy yarn on account of the friction of the yarn on the traveler. As shown at Fig. 12, the yarn on the ring frame comes in contact only with the traveler in passing from the upper guide to the spindle. With the flyer frame, however, there are three points of contact, a, b, c, as shown at Fig. 13. It would seem from a comparison of the two methods that the three contacts with the flyer frame would be as injurious to the yarn as is the one contact with the traveler on the ring frame. The ring frame is much superior to the flyer frame in regard to production. A well-built ring frame can be run at a spindle speed of 4,500 turns per minute on spiral yarn and from 3,000 to 3,600 turns on knotted yarn. The spindles of the flyer frame, however, cannot be run over 1,700 to 2,000 turns per minute. As a consequence the production of the ring frame is 20 to 50 per cent. greater than that of the flyer frame. In order to reduce the time occupied in piecing in spools the yarn intended for fancy yarn is usually wound from the cops on fairly large spools. Even then the time occupied in piecing is much greater on knotted yarn than on straight twist. It is estimated that the fancy yarn twister is idle from 20 to 40 per cent. of the running time.

The first patent for cotton spinning by water power in the United States was obtained by Wm. Pollard of Philadelphia in December, 1791.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Knickerbocker Nubs.

Editor Textile World Record:

How is the spotted effect in the enclosed sample obtained? Stuyvesant (458.)

The sample enclosed is spotted with knickerbocker wool nubs. An expert describes the method of making them as follows

Any kind of fine short wool will answer for making the nubs; the better the wool, the better the nubs. It is a good plan to have the wool felted a little before running it through the card. The closer the workers are set to the cylinder, the smaller will be the nubs. To make them of different sizes raise the workers and set off the doffer according to the size desired. Take the fancy off the cylinder and stop the comb. The nubs will drop under the cards and are then ready for fulling. The doffer should run fairly fast; the faster it runs the more nubs will drop.

The best way I know for fulling nubs is to put them through an Athol or similar duster with the screen taken out and a wood bottom in its place. Then put in the nubs and the fulling soap, start the duster, and the longer they are run the better and harder they will be. Very little soap is required. This is a better way then to put them in a bag and then in the fulling mill. They do not felt together in the duster as they do in the bag. If they are run through a duster felter those that drop under and around the card can be used, while if felted in a bag only those that drop under the doffer are good, as the others would felt together solid in the bag. Those under the leader-in and feed will be seedy. Sam Driver.

Patents.

Editor Textile World Record:

Is a patent obtained from the Washington office of any marketable value before it has been contested in and sustained by the courts? If not, why? Inventor (461.)

The value of a patent depends upon the value of the invention and upon the validity of the patent. Its validity is determined by the courts and a judicial decision confirming a patent increases its commercial value by insuring peaceable possession to the patentee. An adverse decision may destroy the value of the patent to the patentee, but it cannot destroy the intrinsic value of the invention to the world.

The relation between a patent and an invention may be likened to that between a deed and real estate. The value of the deed depends upon the value of the real property and upon the validity of the title.

The validity of a patent, as well as of a deed, can be finally determined only after it has been contested in the courts. Many patents are never contested and in most cases the validity of a patent is assumed from the nature of the invention in advance of any judicial adjudication. Many companies are organized and extensive industries established on the strength of patents which have not been contested or sustained before the courts.

Cotton on Hand.

Editor Textile World Record:

I would like some information regarding the cotton crop. How much cotton of all kinds is now on hand throughout the world, and how much of this stock consists of American cotton? Moore (456.)

On page 205 of our July issue is a review of the cotton market which contains a statement of the visible supply of cotton throughout the world on June 24, 1904, compared with the visible supply on the corresponding day of 1903, 1902 and 1901. The visible stock of American cotton alone on June 24, 1904, was 1,180,234 bales as compared with 1,238,198 bales on the same day in 1903, with 1,650,053 bales in 1902 and with 1,752,708 bales in 1901. What is known as the visible supply includes the cotton in public markets and which is more or less accurately estimated from day to day. In addition to these stocks there is the invisible supply which includes the cotton in first hands throughout the South, also that at the mills or bought for consumption and held until required. The invisible supply throughtout the world at the present time is unquestionably small, as the mills have been forced to run short time for a large part of the past year because of the scarcity of raw material. The general scarcity of cotton has caused high prices. The high prices in turn have resulted in an increase in the visible supply by causing the Southern owners to ship their cotton to market and at the same time causing manufacturers to stop buying.

Matching Mixtures.

Editor Textile World Record:

How can I determine the proportions of each color in the enclosed samples of black and white mixed cloth? Mixture (440.)

The best way to match textile mixtures of different colors is to make small samples, weighing the stock on a grain scale and carding and mixing the different colors on a hand card. One hundred grains is a convenient weight, as each grain is equivalent to 1 per cent. After it has been carded the stock is washed in neutral soap, dried and compared with the sample to be matched. Repeated tests are made until the right proportions are obtained. If facilities are at hand it is a good plan to verify the hand card sample by making a larger one of say, two pounds, carding it on the breaker card. The Torance Mfg. Co., Harrison, N. J., build a small card for this purpose and it is a very useful machine in a mill making mixed goods.

Success Without Bribery.

Editor Textile World Record:

How can a man selling supplies to textile mills avoid the pernicious custom of bribery and maintain his reputation as a successful salesman?

Perplexed Drummer (459.)

A man whose business it is to sell goods to textile mills may be able to increase his sales and thus acquire a reputation as a successful salesman by bribing the employees of the buyers, but he runs the risk of losing costumers by every change of such employees. Bribery is a very unstable foundation for a salesman's reputation. The salesman's employer soon finds out that it is his own money paid to overseers and not his drummer's ability that is bringing in the orders. On the other hand it is exceedingly difficult to conceal bribery from the knowledge of the mill owner. There are numberless ways of detecting the fraud.

The salesman and overseer place themselves over a slumbering volcano when they enter into an agreement by which the drummer's goods are to be favored in return for some gratuity. Mill owners are on the alert for this fraud, so much so that practically every overseer is under more or less suspicion. The honest overseer, who would scorn a bribe, is stifled by the atmosphere of suspicion that surrounds him in some mills. Any expression of opinion for or against a certain machine or commodity with which he has to work is greeted with shrugs of the shoulders, knowing winks, or an air of indifference on the part of the employer which say plainer than words can that the opinion is considered proof of guilt. To retain his self-respect the honest overseer holds his tongue and and lets his employer find out the truth about the work as best he can.

Under such conditions the dishonest overseer finds its impossible to conceal the evidences of his guilt. He may keep still and maintain an attitude of impartiality, letting the owner buy from whom he will, but making sure to have bad work follow any, abandonment from the graft goods. This however, to the suspicious employer is stronger proof of guilt than are spoken words, and in the majority of cases results in the condemnation of the overseer and not of the supplies. The final result is that the overseer loses his position and the drummer loses his trade.

There are many variations of this experience due to differences in conditions and temperament, but in general it represents the state of affairs in the comparatively small number of mills in which graft is possible. In the greater number of mills, including nearly all the large establishments, a system of purchasing supplies has eliminated the system of bribery. Supplies are bought after having stood scientific tests when possible. They are delivered to the mill with as much confidence in their being all right as is placed in the purity of the water supply. Overseers in such mills are as likely to condemn the water supply as to find fault with the supplies. They know that neither the water nor the mill supplies will be changed unless there is proof of defect.

From this brief review of the conditions in the two kinds of mills, those where graft can affect purchases and those where it cannot, Perplexed Drummer may draw the obvious conclusion that a reputation as a successful salesman cannot be maintained by bribing mill operatives. Permanent success can be attained only by selling goods on their merits. A drummer may fool a very small number of manufacturers part of the time, but he cannot fool any of them all of the time. He has only to look a little ways beyond his nose to see that honesty is the best policy. It pays.

Manufacture of Linen.

Editor Textile World Record:

Where can I get information regarding the manufacture of linen, the machinery used in weaving and the processes of preparing the flax by the latest methods, also a record of its production in the United States? Iowa (446.)

Sharp, "Flax, Tow and Jute Spinning," gives the processes for preparing and spinning flax. The machinery used in weaving is practically the same as that used for cotton goods. The United States Census for 1900 gives statistics of the production of flax goods in this country.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The general underwear market is in a fairly satisfactory condition. The spring business has improved considerably since our last issue, and several manufacturers claim to have about all the business on their books that they care for. A few weeks ago it was feared that heavy stocks of light weights would be carried over, but the weather conditions since have been propitious for a good cleaning up, and on account of this buyers have gone about placing their orders with more enthusiasm than before.

Several manufacturers have informed us that their prices have been based on cotton at from 7 1/2 to 8c. and it is now conceded by many that those manufacturers who have sold their product on this basis made a mistake, and the belief is entertained in many quarters that the price of cotton will average nearer 9c. notwithstanding the fact that a bumper crop of 12,000,000 bales is possible.

It is reported that a number of Southern spinners are ready to enter the market and cover their needs for the year when they can buy at 9c. They say that, while undoubtedly there will be a large crop, at the same time there will be a large demand owing to the short crop for the past two years. It is doubtful if cotton goes lower than 9c. and there is a possibility of its going higher as the crop has yet to pass through the critical stage, and with all the curtailment of the past few weeks by manufacturers there is no old cotton on hand.

The present selling season of spring goods has not been the manufacturers' market that it has been for the past two years, and they have been obliged to see their trade two and three times and revise prices to keep some orders on the books, and it has been necessary to get out new samples to supplement the lines they opened the season with.

The Perry Knitting Co. have added to their line a boys' combed Egyptian flat garment at $1.90. This has sewed cuffs, but the fact that it is a combed yarn garment that can be retailed at 25c. will insure its selling.

Rugene Walrath, Little Falls, N. Y., has added to his line of men's balbriggans a line of combed peeler goods, and reports that buyers are taking them in liberal quantities.

The newly organized Chalmers Knitting Co. of Utica, N. Y., is showing a line of

men's porous knit goods to retail at 50c. This is an open-work fabric for which a patent has been applied, and the trade taking the line quite freely; in fact, all lines of mesh or open-work goods are selling well.

Each season shows considerable progressiveness on the part of our domestic manufacturers in making ladies' ribbed vests, and we illustrate today, two 35c. grades, selected from the 1905 lines. While these two garments are quite different from each

other, yet we are informed that both have been bought freely.

A good deal of complaint has been heard in regard to deliveries on certain lines of fall goods. It is claimed that in more than one or two instances manufacturers have delivered goods which nowhere near approach the samples from which sales were made. In consequence of this returns have been made, and buyers are looking elsewhere for something to take the place of the goods they have purchased. This failure to make goods up to sample has been caused by the effort to secure a profit from prices that on the present basis of raw material, would yield a very small margin if any at all. Knowing that it is impossible to cheapen the cost of production certain manufacturers have tried the only other method available and have caused themselves more or less trouble.

Some retailers have complained about the 6 lb. ladies' ribbed goods, but in almost every instance to which our attention has been directed we found that the goods were up to sample and that it was only a matter of the merchant being disappointed with the light weight goods.

The fact that cotton has taken a drop has encouraged retailers to complain on the slightest provocation, and it behooves manufacturers to be absolutely sure that their goods leave the mills right and up to samples in every particular. Retailers seem to forget that they bought goods on a basis of cotton at 9 1/2c. and not on a basis of the high prices at which cotton has been quoted for the last few months.

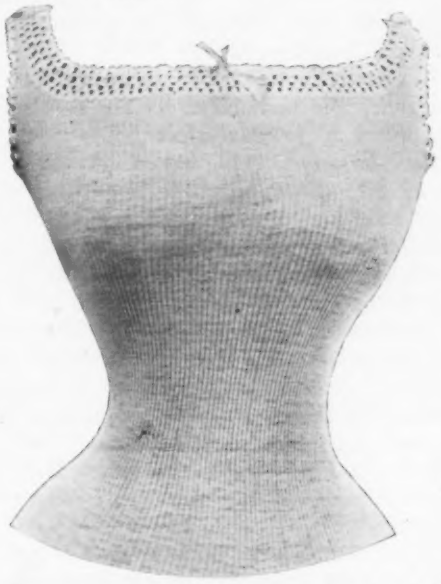
Ladies' 6 lb. ribbed goods may be bought today at $1.90, extra sizes weighing 7 1/2 lbs. at $2.15. We have heard that 7 lb. ordinary sized goods are being offered at $2.00, but comparatively little demand is noted for current goods.

Manufacturers of wool underwear report a very satisfactory condition. Prices are very firm due primarily to the condition of the wool market. It is practically impossible for the seller to secure an advance on account of the majority having covered themselves with raw material, and the advance has not influenced the manufacturer except to cause increased firmness.

The situation on fleece goods is little changed and buyers are operating cautiously. Some manufacturers have sold their production and others are confident that the duplicate orders will take care of what they have left to sell. Although some irregularity is noted, the majority of manufacturers are holding to their original prices and feel confident that the trade will be of sufficient volume to prevent any continued depression.

HOSIERY.

Selling agents in the hosiery trade state that the outlook is assuming a more cheerful aspect; conditions are improving each day, and with a little more confidence on the part of all concerned a revival of good old times will be in evidence.



The new light shades for spring are being carefully looked over, and a spirit of conservatism shows itself in the orders being placed.

The very fine gauge goods of slightly heavier weight than last season are being selected to take the place of the very gauzy effects. Duplicates on fall lines are coming in quite freely and at fairly remunerative prices.

There is some talk of advancing prices on certain lines of spring goods, the sellers beginning to realize that some prices have been made too low.

There seems to be a wide diversity of opinion in regard to laces. One of the largest domestic manufacturers has dropped them from his line entirely, while some buyers say they will be good again for 1905.

CHEMNITZ REPORT.

There has been no change of any note during the past few weeks in the hosiery trade. Prices are still firm and indications are that they will remain so until the season is over, as contracts on yarn at high prices are now running into next spring and for that reason, a drop in prices is not liable, especially as nearly all manufacturers have their books full of orders. Importers have placed liberal orders on staples, even at the high prices and as machinery is now all engaged up to December, those who have not placed their orders will find difficulty in getting their goods delivered on time.

In certain lines of split foot goods, there is a scarcity and manufacturers are now refusing orders at popular prices.

Lace hosiery is being taken very well and prices are firmer on these lines than they have been for some time. Some styles that were offered at special prices, have now been withdrawn from sale. There are no stock lots in the market, having all been used up for tan shades and embroidering. The trade for embroidered lace hose has increased considerable lately, although early in the season, it looked as though this class of goods would not be as popular as last season. Striped hose are still very slow. Jacquards are selling fairly well, but not in as large quantities as last year.

In the embroidered goods, the low grades with machine tambour are not so much in demand, but hand embroidered effects are being taken fairly well. Tans, champagne, and other light shades are being bought again for another season. The fine gauze goods which were somewhat slow a month or two ago have also picked up, and it is predicted by some that they will be used fully up to last season.

In men's half hose all kinds of fancy styles are taken, striped as well as jacquards. Large lines on new and very effective patterns are being shown and leading manufacturers have already large orders on their books. Stocks of lace half hose that had accumulated, have been absorbed during the last month and now there has been some fairly liberal orders placed for next season.

There has been some large orders on gloves placed lately, but still there are several of the largest buyers who have not as yet operated. Silk gloves are not bought as freely as last year. Some of the leading houses have taken up a few numbers of long silk gloves, but in small lots only. The leading articles will undoubtedly be the two clasp lisle and Milanese gloves. Great care is being taken this season to make the better grades of gloves to look attractive by extra stitching around the top, Paris points and other little improvements which go to make up a sightly glove. Net back gloves are being taken freely, especially in the better grades and mostly embroidered fancy points. The lower grades which were taken last season without any points, are being purchased for next season with silk or kid points.

Ramie.

BY OPEN MESH.

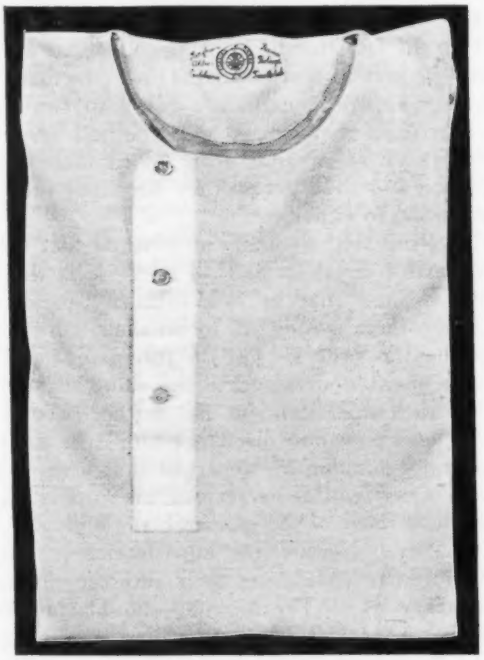
Considerable interest has been aroused of late by the introduction of a line of underwear made from the ramie fibre, and the purpose of this article is to give in brief form a description of this interesting plant.

Ramie or China grass is a perennial shrub belonging to the nettle family. It is claimed to be indigenous in India and probably also in China. It has been cultivated from time immemorial in China, and has long been grown for its fibre in Japan, Java, Borneo and Sumatra, and has been introduced into the warmer temperate and sub-tropical portions of North and South America, Europe and Africa. In the United States it has been grown in the gulf states and California, and has been experimented with as far north as New Jersey.

The plant cannot stand frost, and while it may be grown out of doors in some situations north of the gulf states, it will not mature its two crops and its growth is uncertain.

It is said by Favier that ramie seed was

first introduced in France in 1836, and in 1844 plants were brought from China by the surgeon of the war-ship "Favorite." One writer claims that the plant was first brought to the gardens of Europe in 1733, while Favier states that Dr. Fras first cultivated the plant in the botanical gardens in Munich in 1850 and that it was not grown in Belgium until 1860. Our own introduction dates back to 1855, but the records seem to show that it did not obtain a foothold in Mexico until 1867.



The active interest in ramie began in 1869 when a reward of £5,000 was offered by the government of India for the best machine with which to decorticate the green stalks. Trials were held in 1872 and 1879, but no machine was found to fill the requirements and the reward was withdrawn.

The first record of shipments of ramie show that in 1872 between two and three hundred tons of fibre were sent to London valued at about £80 per ton. India also sent small shipments, but the demand was very light and prices fell £30 to £40 for Chinese and £19 to £30 for the India product. China is at present the chief source of supply of the raw product. It is cultivated almost exclusively in the basin of the Yang Tse River.

The Chinese dig up the roots in the fall, separate them into small bunches and replant. When they are 3 1/2 to 4 feet high the plants are usually cut three times during the year—in May, August and October. The first crop is longer fibre and better quality than the latter two. The preparing is all done by hand labor. After being cut it is put into water and rotted (the same as hemp is treated) then beaten with a flail and broken, the bark being carried off with the water. From this point there are two processes of working. The lighter colored fibre is dried over a charcoal fire and used for the finer commercial forms, while the dark colored fibre is dried in the sun and used for fish nets, cordage, etc.

The fibre of ramie is strong and durable, is of all fibres least affected by moisture, and from these characteristics must take high rank in value as a textile substance. It has three times the strength of Russian hemp, while its filaments can be separated almost to the fineness of silk. It has been spun on various forms of textile machinery, also used in connection with cotton, silk and wool, and can be used as a substitute for all of these textiles where elasticity is not essential.

It produces a superior paper, the fineness and close texture of its pulp making it a most valuable bank-note paper.

The fibre can be dyed in all the desirable shades, some of which have the lustre and brilliancy of silk.

It is particularly applicable for goods for which linen is now used on account of wearing and washing qualities. The most important hotels and railway companies in France are said to have adopted ramie. and it is ordered for the dressing of wounds in several hospitals, including those of the army and navy. The French minister of war employs it for cordage of balloons, powder sacks, etc., and the Bank of France now uses nothing else for the manufacture of its notes but the ramie supplied by the Valobre factory.

Ramie is also being used for knit goods. The accompanying illustration shows a ramie undershirt for men's wear. It is made at Carlskrona, Sweden, by the Ringheim-Schlichter Co., whose goods are now being introduced into this country.

MANAGING THE HELP IN A KNITTING MILL.

BY NOEL HOWE.

What are the best methods of securing efficient service from the help in a knitting mill? This is a question which admits of a great many different opinions. Every manager, superintendent and foreman has his own ideas as to the best methods of securing efficient service from the help, and each thinks his ways and ideas are the best. My answer will necessarily be the expression of my own ideas, gained from practical experience in handling help as a foreman, superintendent and manager; as a foreman, with the help directly under me, with the superintendent and manager over me; as a superintendent, with all the foremen of the different departments under me and the manager over me; as a manager, with no one above me, and the superintendent, foremen and all others under me.

It may be stated generally that the best service is obtained from help, whether superintendent, foreman or operative, when each has but one "boss." That is to say, only one person from whom each is required to take orders respecting his work, or by whom he will be reprimanded for bad work or inefficient service. Each person in authority should have entire charge of his department and power to hire and discharge the help directly under him, subject of course to advice and consultation in these matters with the person next above him. The manager should deal directly with the superintendent only; the superintendent directly with the foreman of each department; each foreman. directly with the help under his charge. The manager and superintendent should not deal directly with the help except in case of a strike or some other serious trouble affecting the interests of the concern, and even in these cases the difficulty should, as far as possible, be settled through the foreman.

If the manager, when passing through the mill should notice that some of the foremen are not attending to their duties or that some of the help are not doing their work as it should be done, he should not say anything directly to them, but should make a complaint to his superintendent who should call the attention of the foreman to the matter, and he will deal directly with the help. When the manager or superintendent deals directly with the help in the matter of orders or reprimands, the help resent having two or three bosses. The foreman, although he may not say anything either, resents having some one interfere in what he considers his duty, and both operative and overseer lose interest in their work; the foreman's resentment arises from the fact that he in being interfered with and he says to himself that if they (the manager or superintendent) are going to run his department they can do so. The help resent orders or reprimands from more than one person and soon get so they don't pay much attention to either.

Let the help distinctly understand that the foreman over them and no one else is their "boss," and that he has authority to discharge them if they fail to do their work or disobey his orders. Let the foreman of each department understand in the same manner that the superintendent has authority over him, and power to discharge him if he finds he is not running his department as it should be. They will then respect his orders as much as those of the manager, the highest in authority. Neither the superintendent nor the foremen should use their authority in an arbitrary way. The foreman should consult with the superintendent regarding the hiring and discharging of the help under them. The superintendent should also consult with the manager regarding orders to be given out, also respecting the work of the foremen, so the manager will be fully informed as to what is being done in the mill. What they decide upon should be given by the superintendent to the foremen, and by the foremen to the operatives in the several departments.

If the superintendent considers a foreman incompetent or negligent in the performance of his duties, he should talk the matter over thoroughly with the manager and if it seems best that he should be discharged the superintendent should do it. Although the superintendent has power to discharge any of the foremen, I do not think he should exercise it without first consulting the person next

above him, whether it is the manager or president, and ascertaining his wishes in regard to the matter. If they agree, all right; if not, better service may be obtained from the foreman in the future if he is called to the office for a private talk with the manager.

As an illustration of the one-boss idea, I will state the following instance as told to me. A foreman in the morning on entering his room thinks as the weather is warm the windows should be opened, and calls a boy to open them, which he does. After a while the foreman notices that one of the windows is closed. He asks the boy why he did not open them all. The boy says he did so, but the girl near the window told him to shut it because she was cold. This is trouble number one from the boy's obeying an order from some one besides his boss. Then the foreman reprimands the boy and tells him tnat when he tells him to do a thing he is to do it, and not take orders from the help. Then the foreman goes to the girl, tells her that he gave the boy orders to open the window and she should not nave told him to close it. Then he opens the window himself. The girl says nothing until the superintendent passes through the room near her, then she goes to him and says she finds it too cold with the window open and would like to have it closed. The superintendent closes it. Trouble number two. The superintendent should have told the girl to speak to the foreman about it, then if she had told him the circumstances it would have been his place to tell her that he would speak to the foreman. After he had heard the foreman's side of the case he would have been able to judge whether he acted right in the matter or not. If he had, he should uph ld the foreman; if not, he would have an op,portunity to tell him so.

On the other hand the foreman finds that the superintendent has closed the window without asking him about it and he naturally resents this interference with his orders. Doubtless the superintendent did not think his simple action would make trouble or he would have been more careful, but this case shows how necessary it is in a mill to stick strictly to the one boss idea. The foreman feels that it is not much use for him to give orders if they are to be disregarded by the superintendent. The girl has lost her respect for the orders of the foreman for she knows that when they are not pleasant for her she has only to speak to the superintendent to have them disobeyed. The foreman loses interest in his work and the most efficient service from him is lost. If the girl had known and thoroughly understood that the foreman was the only boss so far as she and the window were concerned she would doubtless have gone to him and asked him to give orders to have it closed. No doubt he would have told the boy to close it and all would then have been well. The trouble arose from the fact that one of the help, in this case the boy took orders from more than one person.

The same principle applies to other matters respecting the work. The foreman of each department should have full control of all the help under him and have entire responsibility. If he is the right man for the position more efficient service will thus be obtained from him, as he will be more interested in his work and will be quite willing to be advised by the superintendent. The superintendent and foreman will then work in harmony and this will serve the best interests of the company by whom they are employed. Where the other system prevails the superintendent and foreman are working against each other and the business of the company suffers.

Some manufacturers may hesitate to give the superintendent and foreman full control in this way, fearing it is putting to much authority in their hands, and that the superintendent might turn out to be obnoxious to the foreman and the foreman obnoxious to the help. When this is the result, they are not the right men for their places and a change should be made. "A man cannot serve two masters." This is certainly true as regards help in a mill, whether it be the superintendent, foreman or operator.

As a manager I found I obtained the most efficient service from my superintendent by consulting him on all matters and details respecting the work, machinery and employees, and by allowing him to give all orders to the foremen and carry out my ideas

and plans as if they were all his own, and also by allowing him to carry out some of his own ideas. As a superintendent I found the most efficient service was obtained from the foremen by allowing each to hire and discharge the help in his own department, and at the same time holding him responsible for the quantity and quality of the work. By adopting this method I found them always ready to consult and confer with me on all matters and that they were respected by the employees. I would confer with the overseers and get their ideas as to alteration or improvements in the work, and when their ideas were practical they were allowed to carry them out; when they were not, I explained to them thoroughly the why and the wherefore. As a foreman, I secured the very best service from the help under me by using them right, respecting their feelings, treating them fairly and impartially without any favoritism whatever, giving the orders for the work to be done in a proper manner and not in an overbearing or dictatorial way, making them understand that we were all working for the interests of the company and that in order to best do this it was necessary for them to do exactly as they were told. When it was necessary to reprimand them for bad work, I explained to them the loss that accrued to the company as a result of their neglect or carelessness. If that was of no avail I had a little confidential talk with them. I never spoke to them angrily before their fellow employees, as that humiliates them and does no good. To get the best service from his help it is necessary for a foreman to study the dispositions of his operatives and act accordingly. With some a slight reprimand is sufficient; with others talking has no effect whatever; it goes in one ear and out the other. Then it is necessary to use as few words as possible, but make them distinctly understand that you mean exactly what you say, and in most cases this will end the trouble with them. In this way a foreman can maintain a good discipline and have the respect and good will of all his help, the most efficient service will be obtained and the best interests of his employers be conserved.

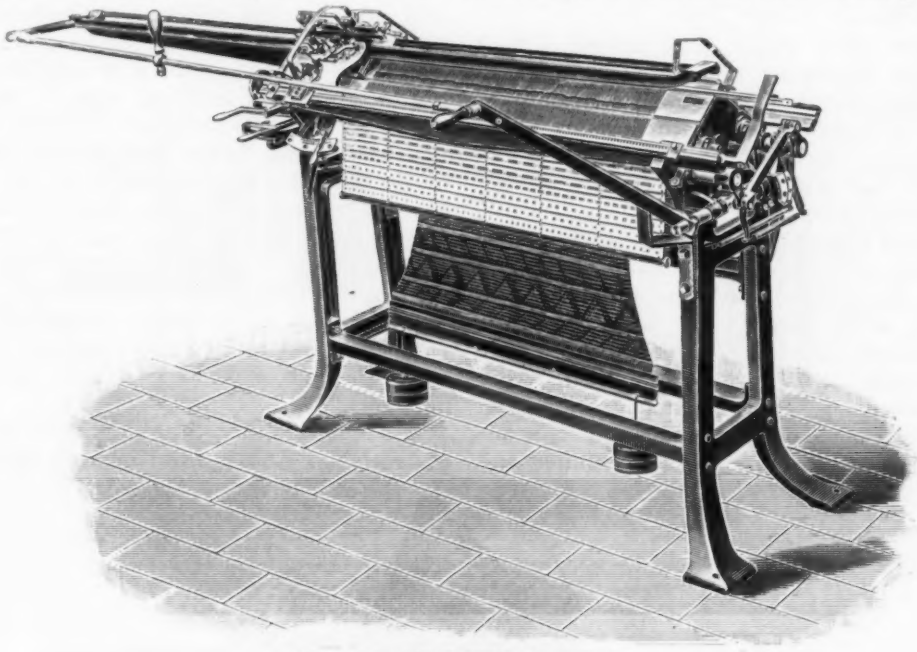
In some mills the owners try to get better service from their employees by becoming interested in their employees outside of their work. I remember one mill that put a piano in the finishing room where the employees who ate their lunch at the mill could have a little music and dancing during the noon hour. Perfect discipline was maintained and the music stopped immediately on the blowing of the whistle. Other recreation for the male employees was provided by the formation of a baseball club, the two sides representing respectively the married and the unmarried men. The bats, balls and outfits were supplied by the company and games were played on Saturday afternoons during the summer months. In the winter time there was basket ball in the mill. This mill also provided entertainments two or three times each year which were held in the finishing room of the mill, the goods being moved to one side for the occasion. One of these consisted in the exhibition of fancy work of all kinds which had been done by the employees. Judges were appointed and valuable prizes were given by the mill for the best work shown. Music and readings by the employees were followed by light refreshments of sandwiches, cake and coffee, and then dancing till midnight. A corn roast was another entertainment held in the fall of the year, with bicycle races by the employees. In the winter there was a sleigh ride in large bob sleighs hired by the company for the occasion, and after the ride refreshments, music and dancing.

There is no doubt that this mill secured better service from their employees by this method of treatment.

I have been in mills as manager, superintendent or as foreman where the one-boss idea was strictly carried out. I have also been in mills where it was not carried out. In the former everything worked smoothly and harmoniously, and there were scarcely any trouble with the help. In the latter, trouble with the help and the foremen were of almost daily occurrence, the result being a financial loss to the company. The best results can only be obtained when manager, superintendent, foreman and operatives work harmoniously together.

NEW JACQUARD NOP PATTERN MACHINES.

The accompanying cut illustrates a new jacquard nop pattern knitting machine recently brought out by the G. F. Grosser Knitting Machine Co., Markersdorf, Leipzig, Germany, with branch office at 260 West Broadway, New York. This machine includes the latest improvements and is the most recent development in this line. Thirty years ago the only machines for producing nop patterns were the well known three and four set cam knitters. Pineapple effects, interrupted with rack designs were the usual patterns for the few fancy articles made at that time. The increased use of knit goods for all dressing and sporting purposes necessitated more varieties and better patterns. The knitting machine builders did their best to construct a machine adapted for this kind of work. G. F. Grosser was the first to apply the jacquard system. In 1872 the first trial was made with a jacquard cylinder containing six fixed cards and the success obtained with this new improvement encouraged him to develop the idea. A long moving card was substituted for the six fixed cards on the cylinder. In the meantime many new patterns combined with varicolored stripes and transparent work were brought out. The capacity for new patterns was still further enlarged by the addition of a helping needle bed at the front below the ordinary needle bed. This machine produced colored spots on the nops or in the rack-ranges of the fabric, still working the ordinary nops without variation on both sides of the pattern.



THE GROSSER KNITTING MACHINE CO.

The aim to perfect and improve the fabric produced on the jacquard machine by obtaining new effects and combinations, suggested the idea of building the new machine as illustrated in this cut. The improvement consists in the application of two independent jacquard attachments on both needle beds. The builders state that all varieties of nops with colored spots on them or in the rack ranges, welts, etc., or nops on the front and back of the patterns may be made with this machine, also all kind of colored patterns, forming figures between the nop stripes. By adjusting the two jacquard attachments to the right and to the left there is practically

no limit to the variety and style of patterns that can be produced on this machine.

The jacquard cards include the whole range of current patterns. The special cardigan cams fixed in this machine permit the use of inferior material and tender yarn. An automatic and positive striking arrangement makes it possible to work even the six row nop. When working colored spots on the nops the silk thread does not appear in the inner side of the fabric if no striping is desired there.

It is stated that a good knitter without special knowledge of jacquard work can operate this machine as the most improved automatic devices are attached. This is said to give a very large production. These machines are built in all sizes and gauges required for sporting and ordinary articles, such as vests, sweaters, petticoats, cuffs, mittens, cycle hose, etc., and also for articles with the pattern partly on the front and partly on the back.

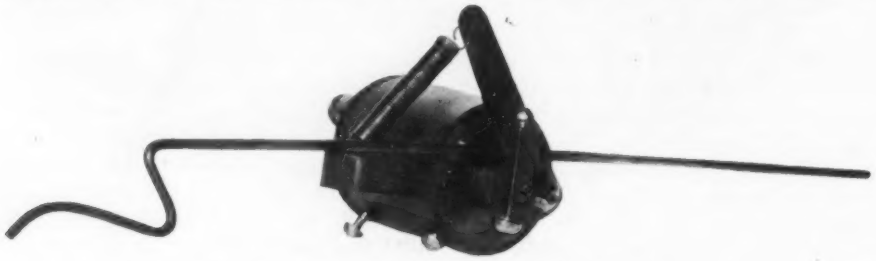
The machine is built for power and is fully automatic. It is provided with all the recent improvements, such as stop motion, etc. One workman or a girl generally operates four heads, as no handwork is required and all changes are made by chains and cards. Samples of the work done by these machines will be sent to any interested manufacturer upon request. Further information can be obtained from the Grosser Knitting Machine Co., Max Nydegger, manager, Wool Exchange Building, 260 West Broadway, New York.

THE QUAKER CITY STOP MOTION FOR KNITTING MACHINES.

The knit goods manufacturing trade will be interested to know of a patent recently issued for an electric stop motion which is claimed to be an improvement over all previous mechanical devices for this purpose. Every manufacturer can readily appreciate the usefulness and great economy to be derived from an appliance of this kind, which should find a ready market among progressive knitters.

The appliance itself is very simple in construction and light in weight, but durable, easily installed, demanding little attention, and inexpensive considering the benefits to be derived. It is guaranteed to work at all times when a stop motion is expected to operate. It can be readily adapted to all classes of knitting machines. The manufacturers state that it has worked successfully on the Campbell & Clute, the Tompkins and the Crane heads stopping these machines not only for a broken end, but also for a broken needle and entirely eliminating the annoyance and expense of back winding and running on by stitch, thereby increasing the production and making more perfect work, while the cost of mending is reduced to a minimum.

The Quaker City Stop Motion Co., of Philadelphia, whose advertisement appears in this issue, are the sole owners and manufacturers of this stop motion and are now busily engaged on orders already received and are sending men to the various knit goods centers to fit up machines in the mills from which they have received orders. Its simplicity and adaptability have been quickly recognized and many have signified their intention to equip their knitting frames with the device. The manufacturers invite correspondence from all interested in knitting stop motions, and are confident that a trial of this new motion will demonstrate its merits.



QUAKER CITY STOP MOTION FOR KNITTING MACHINES.

A DIAL ADJUSTMENT FOR KNITTING MACHINES.

A method of adjusting the dial plate and upper end of the needle cylinder of a knitting machine has recently been patented in this country.

Fig. 1 represents in cross-section a needle-cylinder, cam-cylinder, and yoke sustaining the dial-needle plate, the shaft for actuating the cam-cylinder being in elevation. Fig. 2 is a plan view looking down on part of the machine shown in Fig. 1 with the segmental cam-carrying parts of the cam-cylinder removed. By removing the screws b^4 either or both of the cam-cylinder segments may be detached from the toothed part of the cam-cylinder and be withdrawn bodily laterally from the needle-cylinder and needles thereon, leaving the needles in the grooves of the needle-cylinder.

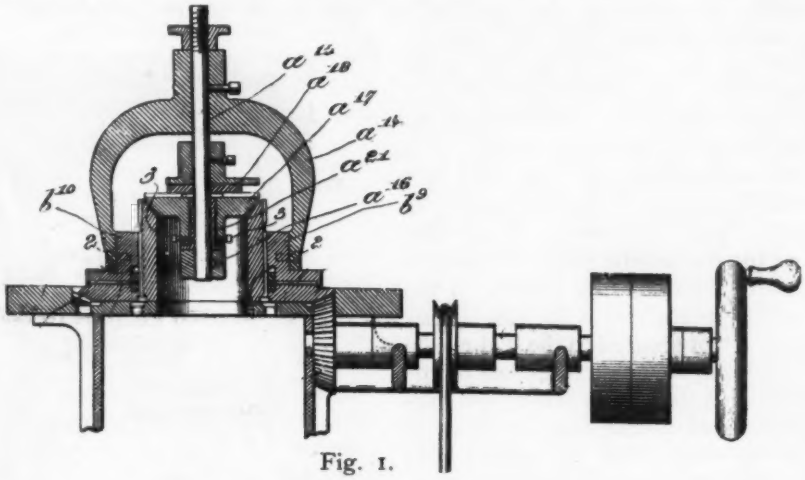


Fig. 1.

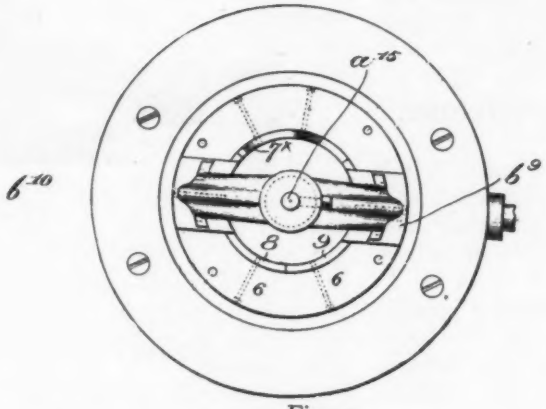


Fig. 2.

The uprights, b^9 b^{10}, have secured to them by screws, 2, the legs of a yoke, a^{14}, that receives adjustably in its upper end a rod, a^{15}, the lower end of which enters the space in the needle-cylinder. The lower end of this rod has connected with it by a suitable screw a block, a^{16}, which consitutes a support for the hub of the dial-plate, a^{17}, said plate being sustained loosely with relation to the rod, but being restrained from rotation by or through the needle-cylinder during the operation of knitting.

The rod has fixed to it above said dial-needle-plate a dial-needle cam, a^{18}. This cam rotates with the cam-cylinder as usual, and re-

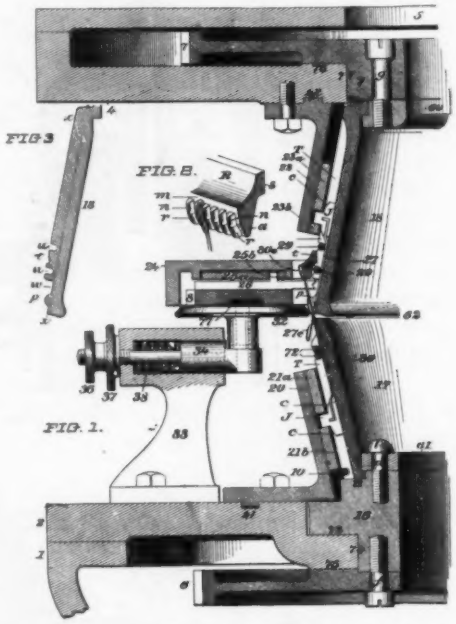
ciprocates the dial-needles to and fro in the dial-needle bed. It is essential that the face of the dial-needle bed support the dial-needles, so that they in their reciprocations shall cross the plane of movement of the cylinder needles at exactly the proper points, and heretofore considerable difficulty has been experienced in locating the face of the dial-needle plate exactly in proper relation to the upper end of the needle-cylinder.

To provide for adjusting the dial-needle plate in a simple manner, there has been inserted from the lower end of the hub of the dial-needle plate a flanged sleeve, a^{21}, that fits the rod, a^{15}. The somewhat enlarged upper or inner end of said sleeve, Fig. 1, is fixed to the dial-needle plate, the chief part of the sleeve to its lower or flanged end being out of contact with the interior of the hub. The hub of the dial-needle plate is shown as provided with a plurality of screws, 3, the points of which contact with the sleeve near its end which is not secured to the dial-needle plate. By turning said screws in one or the other direction the end of the hub of the dial-needle plate may be swung more or less with relation to the sleeve until the desired level for the face of the dial-needle plate with relation to the cylinder-needles and the upper end of the needle-cylinder is secured.

A FINE GAUGE KNITTING MACHINE.

There has recently been patented in this country a knitting machine with which it is claimed that finer needles and much finer gauges can be used than have heretofore been possible. Among the advantages it is claimed that the new device makes it possible to knit much coarser yarn on fine needles or on a fine-gauge machine than has hitherto been feasible; to protect the needles against breakage, reducing defects in the fabric caused by broken needles; to increase greatly the range and capacity of the machine for handling all varieties of yarn from the finest and most even and uniform to the coarsest and most tender, and to run the machine at a much higher rate of speed than otherwise would be practicable.

These improvements are said to be specially adapted for use on circular rib-knitting machines, but are capable of other applications. They embrace devices for supporting the heads of the needles when advanced to receive the feed-thread against both rearward and lateral deflection caused by the thrust or wedging action of the sinker-blade in the process of inserting the feed-thread between two adjacent needles. This support is preferably in the form of a ring which in rib-knitting circular machines is carried on some



concentric member of the machine which rotates in unison with the needle-cylinder to the needles of which the feed-thread is supplied, which member in this case is the opposite cylinder, and it may be designed and constructed as an attachable or integral part of such member.

The invention is especially applicable to all machines in which each needle is individually reciprocated, and while the needles are elevated or advanced to the forward limit of their respective strokes the sinker-blades insert the yarn between them to form the loops. It is well known among users of knitting-machines of this class that when the needles are forced forward or upward to the limit of their stroke while the yarn is being sunk be-

tween them they are unsupported except by their attachments in some cases to a driving-jack and by the retaining bands, by which they are confined in their respective grooves in the needle-cylinder and, their tops being unsupported, are liable to be pushed over backwardly by the sinker-blades forcing and straining the yarn around and against them. If the sinkers carry a feed-thread which is large or lumpy, so as to crowd the needles apart or to one side while sinking the loops, the tops of the needles are liable to be spread apart sidewise to such an extent as to produce long loops or stitches of unequal lengths and otherwise defective.

The main object of this invention is to provide a remedy for these evils, to correct this erratic conduct of the needles, and to enable coarse heavy yarn to be knit upon a fine-gauge machine. Straight smooth rods have been long in use in straight knitting machines to support the heads or tops of the advanced needles while the feed-thread is being sunk by the sinkers; but the application of such a support to the needles of circular machines has hitherto remained in abeyance on account, among other things, of the diverse nature of the two classes of machines. As the motions of straight knitting machines are intermittent and successive, while the motions of circular machines are concurrent and continuous, it has not been so easy to adapt characteristic features of straight machines to circular ones as to adapt circular devices to straight machines.

Such straight supporting-bars in straight machines, however, only supported the ends of the advanced needles against the direct thrust of the sinkers, but did not afford any protection against side spreading of the needles, while this improvement not only furnishes a perfect equivalent in a circular machine for the old smooth supporting-bar of the straight machines. but also combines therewith in the same device the means for preventing side spreading or lateral deflection of the needles while the sinker-blades are sinking the loops.

To support the needles for the purposes aforesaid, sockets or matrices for the needles have been provided into which their tops are forced and where they remain while the sinkers are sinking the yarn to form the stitches or loops. These matrices in circular machines are preferably formed on a hoop or ring by groving its periphery vertically in line with the needle-grooves of the cylinder with which it co-operates and by making the openings of these grooves toward the tops of the needles which enter them flaring or trumpet-shaped.

The new machine is illustrated in the accompanying drawings. Fig. 1 shows a vertical section of a circular rib knitting machine, taken through the axis of the needle cylinders. Fig. 2 is a perspective sectional detail of a portion of the matrix ring drawn on an enlarged scale. Fig. 3 is a longitudinal section of the needle cylinder which carries the matrix ring before the grooves are cut.

Two conical cylindrical needle beds, 17 and 18, are used. The upper cylinder, 18, is attached to the gear, 7, by means of a flanged clamping ring, 50, and bolts, g. The upper end of this cylinder, the lower end of the hub of the gear, 7 and the ring, 60, are fitted with shoulders and flanges, as at 70, so as to secure a rigid structure. The hub of gear, 7, is turned to fit a circular opening or bearing in the middle of the table, 4, in which it rotates. The lower cylinder, 17, is attached to the gear, 6, by means of a separable hub, 16, and the clamp ring, 61, the four parts being held together by the bolts, d and f, the ring, 61, binding the needle cylinder to hub, 16, by means of the concentric flange joint, shown at 71. In the centre of the lower table, 2, is a central off-set or depression, which is centrally bored for a bearing for the hub, 16, so that when all the parts are assembled they will form the running joint, 73, 74, 75.

The flaring-mouthed matrices for supporting the tops of the needles when advanced to receive the feed-thread are equally as well adapted for straight knitting where all the needles are attached to a common needle-bar and are reciprocated simultaneously as to cylinder-machines and independently-movable needles. As the bottoms of the indentations in the supporting-ring, against which the backs of the needles rest when forced back-

wardly by the thrust of the sinker-blades, collectively considered, are analogous to and perform the same supporting function as a smooth ring would furnish in the same relation, the smooth or unindented ring is herein regarded as the equivalent of the matrix-ring to that extent.

Fancy Hosiery.

Editor Textile World Record:

Is the demand for fancy hosiery being revived? If so, what class and style are most in vogue?

Peekaboo (463.)

A merchant well informed as to the demand and tendency in the knit goods market answers this question as follows:

As far as ladies' fancy hosiery is concerned there is no revival, but rather an effort to keep it alive. Stripes are dead, machine tambours are very slow and it is really only the jacquards and small, neat, hand embroidered goods on which any business is being done. On men's half hose a large business is being looked for spring on fancies, consisting of jacquards and plated goods, and I have just seen some very attractive styles of small pin dots of white printed on black grounds with embroidered dots.

Fillmore.

Management of Help.

Editor Textile World Record:

What is the best method of securing efficient service from the operatives in knitting mills?

Sacramento (462.)

An article on this subject will be found in another part of this issue.

Duplicating Hosiery.

Editor Textile World Record:

I am a hosiery manufacturer and am frequently called upon to duplicate competing goods. Again samples of hosiery are often sent to me for the purpose of showing the competing fabrics and prices. Can you give me directions for determining how a stocking is made, that is, size of yarn, diameter of cylinder, gauge and other particulars which would enable me either to duplicate the goods or estimate their cost? Haicheng (460.)

This question is answered as follows by a hosiery manufacturer.

This is a question that is often asked, especially in the hosiery trade where a manufacturer often sees a stocking for which there is a good sale and which he wishes to duplicate.

The best method known to the writer is to first carefully count the stitches to ascertain how many needles were used. Then ravel and reel any convenient length and weigh the same. The cotton number of the yarn used is found as follows: Multiply the number of yards by 8 1/3 and divide the product by the weight of the sample in grains and the quotient will be the number of the yarn. It is preferable to use a considerable unmber of yards as the greater the length the more accurate will be the result.

A length of 120 yards is enough to give a reliable test and is very convenient for the calculation as $120 \times 8\ 1/3 = 1000$. The weight is then found by dividing 1000 by the weight in grains.

Ex. 120 yards of yarn weigh 25 grains. Find the cotton No.

$1000 \div 25 = 40$ cotton No.

The calculation can be made from the weight of any other length.

Ex. 44 yards of yarn weigh 8.1 grains. Find the cotton No.

$44 \times 8\ 1/3 = 366\ 2/3$.
$366\ 2/3 \div 8.1 = 45.3$, cotton No.

It is a matter of judgment as to the diameter of the machine upon which the fabric was knit. There is no rule for determining the diameter from the stocking with any degree of accuracy. From the general appearance of the goods those experienced in handling this class of goods can generally form a very clear idea of the diameter of the machine necessary to do the work and can readily duplicate the original sample so closely that it would be practically impossible to tell one from the other.

Foreman.

Transferring Ribbed Tops.

Editor Textile World Record:

What is the best method of transferring ribbed tops on hosiery? John Brown (443.)

It is assumed that this question refers to the ribbed tops made on circular machines for men's half hose. There are ribbed tops made on flat spring needle machines, such as the Tiffany and Cooper, which have a selvage edge. These last are used for full fashioned men's half hose. They are transferred to what is called a transfer bar, which is a flat bar containing points over which the stitches are transferred at the slack course. From this bar they are re-transferred to the needles of the full fashioned frame.

There are two ways of transferring ribbed tops on circular machines and I think it is largely a matter of opinion which is really the better way. One method is employed where the machines have extra cylinders. These extra cylinders consist of the cylinder, the needles, the sinker, and the mechanism for operating the sinkers. The stitches of the ribbed tops are placed directly over and on

the needles at the slack course. The slack course is a course of loops in which the stitch or loop is longer or slacker than the rest of the ribbed tops, and is formed about one-half inch from the end of the tops for the purpose of making it easy to transfer the stitches; it also acts as a guide for putting the top on straight. An expert topper can transfer without a slack course, but it is not so easy.

After the stitches at the slack course have all been put over the tops of the needles, the part of the top above the slack course is raveled down to the needles, leaving the stitches on the needles. The exchange of cylinders is then made in the machine, and while the machine is knitting the leg, heel, foot and toe of the sock, the operator is transferring another top on the extra cylinder. The advantage of this method is that after the stitches have been transferred to the needles, no other transferring is necessary; the cylinders are transferred with the loops on the needles all ready to continue the plain knitting, and it is only when transferring to the needles that the stitches are likely to be missed and dropped. The disadvantages are that the operator, if not very careful when exchanging cylinders, will get the machine out of order. Again in using two different cylinders and continually changing them in the machine, lint is likely to collect under the cylinder, unnoticed by the operator, causing the stitch to be lengthened and making the socks of irregular length.

The other method of transferring is done with what is called a quill ring. This is a ring containing points, similar to the points on a looper, and which are set vertically in the quill ring. The ring contains the same number of points as there are needles in the cylinder, and is made to fit the diameter of the cylinder at the backs of the needles. The stitches of the ribbed tops are put on over these quill ring points at the slack course, and the over plus of the top raveled to the points as in the other way. After making sure that no stitches are missed or dropped, the quill ring is placed over the cylinder at the backs of the needles; the needles of the cylinder then come into the points and the stitches are thus re-transferred to the needles of the machine.

The advantages of this method are the saving of the difference between the cost of extra cylinders and the cost of the quill rings, and the fact that as all the socks are made on one cylinder which is not taken out of the machine, they will be uniform throughout. The disadvantage is that the stitches are transferred twice, first to the quill ring points and then to the needles of the cylinder. The chances of missing or dropping stitches are thus doubled. The quill ring is the latest device for transferring ribbed tops, and the makers claim that it is easier to teach an operator to top or transfer stitches to the quill points than to top directly to the needles. In my opinion the quill ring method is the better one. F. W. H.

Greasy Needle Marks.

Editor Textile World Record:

What is the best method for removing greasy needle marks from worsted hosiery before dyeing?

Argus (442.)

To remove all grease and needle marks from unbleached worsted hosiery before dyeing, prepare a solution of good olive oil soap and soda boiled together, then scour the greasy goods with it. Do not use the solution too hot as it will shrink the goods. It should be no hotter than one can bear to the hand. The strength of the solution is determined by the amount of grease to be removed. If the goods are very dirty and greasy the amount required will be more than if the yarn used is clean. An ounce of prevention is better than a pound of cure. Greasy needle marks are caused by the needle slots of the cylinder and cams being oiled too much. The upward and downward movement of the cylinder causes the oil to work up to the top of the needle where the stitch is and leaves a mark from those slots which have received most oil. To prevent this trouble vaseline instead of oil should be used to lubricate the needle slots and the cams. In using vaseline where oil has previously been used, the needle cylinder, needles and cam ring should first be thoroughly cleaned with benzine. Then after replacing the needles in the cylinder, apply the vaseline with the finger all around the needle slots, and under the butts of the needles, replacing the cylinder in the cam ring of the machine. Some of the vaseline will be transferred to the cams, and as vaseline is a good lubricator a needle cylinder thus greased will not require any more greasing for at least a week. If more should be required it may be added. All danger of needle marks in the goods will thus be avoided. Care must be taken, however, not to use any oil on the parts where the vaseline is used, otherwise the result will be as bad as if oil alone was used. All other working parts of the machine can be lubricated with oil. F. W. H.

North Carolina, Raeford. The Raeford Power & Manufacturing Company has been incorporated with capital stock of $200,000, toward which $15,000 has already been subscribed. They propose developing power and operating cotton mills. J. McLochlin, J. Upchurch and J. Blue are interested.

(For Knitting Mill Items see Mill News.)

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

We invite machine builders and others to send us such information for this department.

Improved Ring Frame. The Draper Co., Hopedale, Mass., have greatly increased the capacity of their ring spinning frame and the quality of the work by applying the centrifugal bobbin clutch and small ring flange. They claim these improvements have eliminated the most serious troubles of bobbin filling.

Shuttleless Loom. The Anderston Foundry Co., Glasgow, Scotland, are building an improved form of the Seaton shuttleless loom, which was invented in California and exhibited in this country some years ago. The filling is drawn from large bobbins placed on the floor at either end of the loom. One of the looms is in operation at the Bradford Industrial Exhibition.

Centrifugal Bobbin Clutch. The Draper Co., Hopedale, Mass., call attention to their new Rabbeth bobbin clutch for spinning frame spindles. It is described in a circular which is being distributed to the trade.

Dust Separator for Wool Rooms. Matthews & Yates, Leeds, England, have brought out a system for separating dust and loose foreign material from wool and waste while the latter is in process of sorting. Reference to the device is made in the article on the Bradford exhibition in this issue.

Warping and Beaming Machine. J. W. Knowles, Bradford, England, has recently brought out an improved warping and beaming machine which is referred to in the account of the Bradford exhibition in another part of this issue.

Bale Opener. Bosels & Strauch, Gladbach, Germany, have recently brought out a new bale opener which is illustrated in another part of this issue.

Wood Rim Pulley. The Reeves Pulley Co., Columbus, Ohio, have recently placed on the market an improved wood-rim iron-spider pulley which is illustrated and described in this issue.

Mill Safes. Sears, Roebuck & Co., Chicago, Ill., are introducing to the manufacturing trade a safe specially adapted for mill use, to which attention is called in another part of this issue.

Winding Frame for Dyed Chain Yarn. Butterworth & Dickinson, Burnley, England, have recently placed on the market an improved machine for winding yarn dyed in the skein on to spools. The spindles are constructed on the Rabbeth principle and driven by friction which, it is claimed, enables each spindle to take up automatically any slack that may form in the thread. The bobbins when full are taken to the warping machine having an ordinary V creel and then rewound in sections of the required size.

Yarn Traverse Motion. Dronsfield Bros., Oldham, England. A traverse motion for cotton preparing and spinning machinery to impart the necessary vibration to the sliver or roving guide. It is claimed to be an improvement over those heretofore in use.

Cotton Bale. The Whitman Cotton Bale Co., have an exhibit at St. Louis showing their new cotton bale and method of baling. It is described in another part of this issue.

Shuttle Spindle for Cops. The Neverslip Cop Spindle Co., New York City, are placing on the market an improved shuttle spindle for cop filling which is described in another part of this issue.

SCHOFIELD'S AUTOMATIC DUSTER.

Dusters for raw stock were originally made with a straight cylinder, that is, having the same diameter from one end to the other. The stock was thrown into the machine by the operator, who then let the duster run until he felt disposed to open the exit and let the stock fly out. The uniformity with which the stock was dusted by this process varied with the operator, and it was no uncommon occurrence for a dusterful to be left running until the attendant finished a conversation or a wrestling bout with some companion. It would frequently happen that the operator, desirous of expediting the work, would open the exit almost immediately after having filled the machine, and keeping this pace up would deliver stock in about as bad a condition as that in which he received it. In spite of these difficulties the straight cylinder duster has been retained in general use, its only competitor, the cone duster, doing good work, but lacking adjustability to stock of different conditions. The treatment of the stock in the old straight duster was adjusted by feeding and releasing the load according to the judgment of the operator and it needed only the removal of this personal equation to make the machine perfect in principle. This has been accomplished by the application of an automatic device of which one of the best is built by the William Schofield Co., Krams Avenue, Manayunk, Philadelphia, Pa.

THE SCHOFIELD AUTOMATIC DUSTER.

The stock is placed on the feed apron either by hand or automatic feed. This apron delivers a certain quantity into machine and stops. The time of dusting is regulated by change gears. When stock is sufficiently dusted and opened, door at back of willow opens, discharges the cleaned stock, closes again, and the feed apron starts delivering another quantity of stock into the machine.

The light dust is drawn off by the fan on top, the heavy dirt falls through the screen into a drawer below from whence it can readily be removed. These machines are handling all kinds of wools, cotton, cotton linters, hair, etc.; in some places they are used as mixers for blending various grades of stocks. They are also used successfully for dusting grease wool to prepare for scouring. They are fitted with round or flat bar grates (top and bottom) set 1/8 inch, 1/4 inch, or 3/8 inch apart as required, or with woven wire screen of suitable mesh, also with round or square teeth as desired.

This machine will do the work just as the overseer wants it done, uniform and regularly. He need not depend on the operator. It feeds and discharges itself automatically at regular intervals; is adjustable and can be set to meet the requirements of the stock. It is well known by all practical manufacturers that where it is necessary to depend on the operator of a machine to do certain work at stated times—(as feeding and discharging the stock in a hand willow) he will fail of that accuracy that gives regular and uniform results, some of the stock will be dusted too little, or on the other hand left in the machine too long and spoiled.

Following are a few typical letters received from users of the Schofield automatic duster.

Philadelphia, November 17, 1903.

Gentlemen:—In reply to your favor of the 16th inst. in reference to your "Automatic Willow" sold to us some time ago, beg to say that it has fully come up to our expectations and has done all that you represented it would do.

Yours truly,

SYKES BROTHERS.

Manufacturers of Carpet Yarns, S. E. Cor Hancock and Huntingdon Sts.

Philadelphia, December 19, 1903.

Gentlemen:—We beg to advise that the "Automatic Willowing Machine" which we purchased from you some time ago has proven a good machine and one which has given us entire satisfaction. We remain, Yours truly,

JOHN BROMLEY & SONS.

Lehigh Ave., below Front St. and Front, York and Jasper Sts.

Bridgeport, Pa., December 14, 1903.

My Dear Sirs:—We have had one of your Automatic Willows in operation now for some weeks past, and beg to say that we have found same to be satisfactory in every way, and is everything you claim for it. We have noticed a big difference in our stocks since we have been using the willow, inasmuch as they are more evenly mixed, and much more lofty, and can say for a fact that since we have been using your willow we have had better yarn and much less complaints from our weavers on account of it. We think it a real necessity in every mill, and would not now be without one.

Very respectfully yours,

I. W. SMITH, Est.

Manufacturers of Cotton and Woolen Goods.

Dusting the raw stock is a very important process in textile manufacturing. It removes from the raw material everything that should be removed and leaves all that can be converted into cloth. The Schofield duster can be found in many of the best domestic mills and we are informed that about one hundred of them have been sent to eastern wool growing countries to be used for dusting grease wool. Further information as to this useful machine can be obtained upon application to the builders.

AN IMPROVED DISC FAN.

The American Blower Co., Detroit, Mich., call attention to the striking progress made by them in the manufacture of direct-connected disc fans and motors. The new fan is a modification of their well known "A B C" fan, which has been on the market perhaps longer than any other and is in more general

use. Previous to the working out of this design the custom has been to attach a motor to the arms of a disc fan, but the excessive weight of the motor, overhung in this way, has often been an objectionable feature. In the new combination the motor is placed on a

substantial base, there being no bearings except those in the motor. This makes by far the most rigid and compact form of construction, the total width of the outfit being no greater than with the overhung type.

The exceptionally high efficiency of both the "A B C" fan and the Westinghouse motor and the fact that the prices charged are very low, make these outfits very desirable for cooling and ventilating.

Further information can be obtained by addressing the Detroit office of the American Blower Company, or any of its branches.

SCUTTLE AND SKYLIGHT OPENERS.

The strong objection to the ordinary scuttle in roofs and to the usual method of opening and closing skylights has led to the construction of two devices which the manufacturers believe fill the purposes perfectly for which they were intended. A scuttle should not only be built to open easily so as to afford an escape for foul air

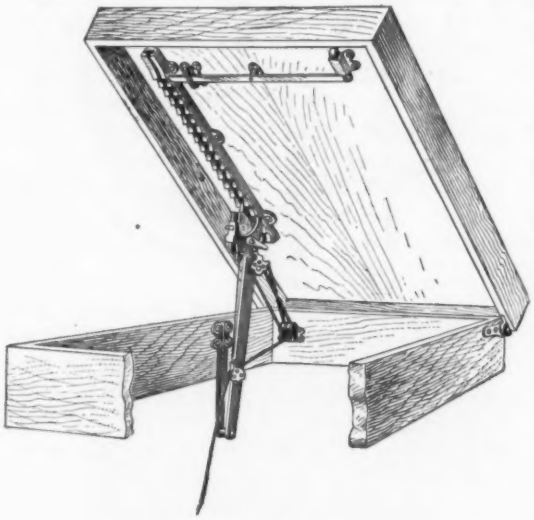


FIG. 1.

and permit of ready egress in case of fire, but should also permit of being fastened securely when closed. The scuttle opener built by the G. Bickelhaupt Skylight Works, 243 West 47th St., New York, and shown at Fig. 1, is believed to answer these requirements. One pull of a cord opens the scuttle which remains in position until it is to be closed. It is closed as easily as it is opened and is locked securely by two automatic bolts. The device is made of

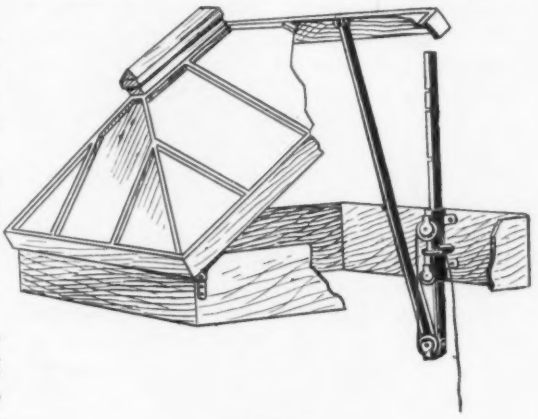


FIG. 2.

wrought or malleable iron and guaranteed not to break or become disarranged with ordinary usage. A large number of them are now in use having been approved by mill owners, builders and architects.

Fig. 2 shows an automatic skylight lift and lock manufactured by the same concern. It is readily applied to any skylight and can be raised and lowered as easily as a weighted window. Like the automatic shuttle opener, it is operated with one cord only from the floor and when closed is securely locked without further attention. It is in general use and giving complete satisfaction. An illustrated circular describing these attachments will be mailed to any one interested upon application to the manufacturers.

MILL SAFES.

Outside of the counting room where the necessity of protecting money and mill records is generally recognized and provided for, textile manufacturers are extremely careless in regard to the care of mill records. While these records are not likely to be stolen they are easily destroyed by fire, causing a serious and in many cases irreparable loss to the mill. Buildings and machinery may be insured and replaced, but the records of the construction

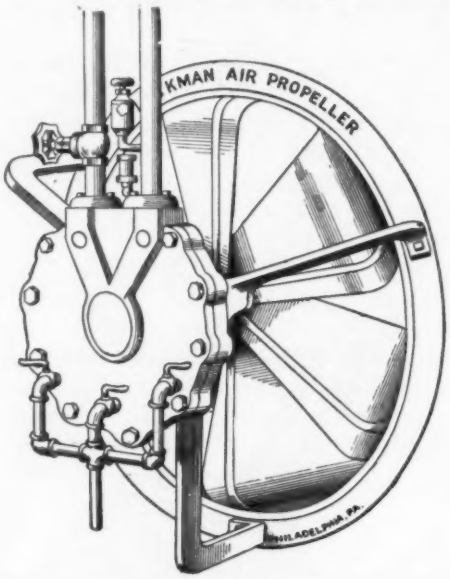
of fabrics and operations of the mill cannot be restored if once lost, yet they are generally scattered carelessly throughout the mill, exposed to complete destruction by even a very slight fire or other accident. Such neglect arose when textile manufacturing was carried on by rule of thumb and records of mill work were crude and to a great extent retained by workmen as secrets of the art. Now all that is changed. System and scientific methods in every department of mill work, with accurate records of past operations, have become essential to success in textile manufacturing.

This has made a reliable safe as essential to the work room as it is to the counting room. There is not an overseer, designer or superintendent in the mill who does not need a safe in which to keep the records relating to his department. This want has been supplied by Sears, Roebuck & Co., Chicago, Ill., who build and sell a line of safes which includes those particularly well adapted for mill work. Their advertisement in this issue gives particulars as to size, price and terms. They are selling excellent safes at a very low price and offer to send them on trial to responsible parties and to pay freight charges both ways in case the safes do not prove satisfactory. This is a good opportunity for textile manufacturers to equip their mills with what modern methods have made a necessity.

VENTILATION OF DYE HOUSES.

During the warm weather when the dyer is not troubled with the dense fogs that harass and hamper him in cold weather he is inclined to forget the matter instead of looking forward and preparing to overcome the trouble. There is little doubt that the condition that exists in dye rooms during cold weather is a large source of loss and it is a source of wonder that it is permitted to continue when there are positive methods of overcoming it. No doubt a great deal of the indifference is caused by the fact that the problem is one that has not been intelligently handled, that is, the methods used are not in the right line, or if right are not carried far enough to bring good results. Their main object is to secure enough warm air to absorb the moisture rapidly as it rises from the tubs and carry it away before it condenses and makes the heavy fogs. One of the greatest obstacles to this is the operation of the necessary machinery without too great expense, as belting from a line shaft is almost out of the question in such cases.

E. M. Nichols of Philadelphia has recently closed some fine contracts for this work, using his Blackman fan with direct connected engine to exhaust the air which is admitted at the proper temperature. In many cases this is secured without additional heating



facilities other than the mill or factory can afford; in other cases special provision has to be made. The fan requires practically no attention after it is once adjusted for operation. It has been on the market so long that its efficiency and reliability are firmly established.

Mr. Nichols' past success in this line entitles him to the confidence of all and he is well fitted by experience to handle the difficult problems that arise in this line of engineering. Whenever possible, he guarantees the results to be obtained from his work.

Asclepias wool or vegetable silk comes from various tropical plants and is used to a large extent in upholstery work.

AN IMPROVED PULLEY.

A new iron-spider, wood-rim pulley, which appears to possess all the advantages of an iron or steel pulley has been brought out by the Reeves Pulley Co., Columbus, Ohio. It is especially designed for textile mill, dynamo and similar service, and is built in three designs, shown at Figs. 1, 2 and 3.

FIG. 1.

The first, Fig. 1, is made split and fitted with interchangeable iron bushings so that it will fit any size of shaft up to and including 3 1/2 inches by simply changing the bushing.

Fig. 2 shows the second form, which is made split and bored to fit the shaft, no bushing being used.

Fig. 3 is made solid and bored to fit the shaft.

FIG. 2.

The rim construction is the same as that used in "The Reeves" wood split pulley, the segments being cut short and nailed and glued together. The iron arms extend into the rim and are held firmly by an iron pin so that it is impossible for them ever to work loose. All the iron parts and the inside of the rim are finished in black, and the face is finished in transparent orange shellac, the same as "The Reeves" wood split pulley.

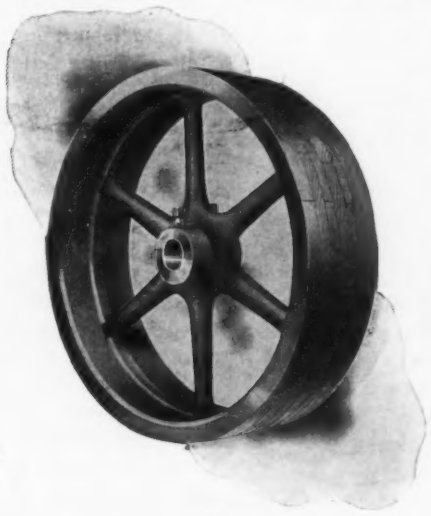


FIG. 3.

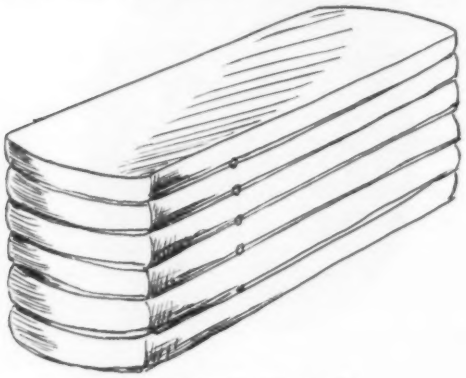
The new pulley has the superior feature of a wooden belt face to which a belt will adhere much better than to an iron or steel face. Although this line has just been launched, the Reeves Pulley Co. state that they are having a lively demand for them.

THE WHITMAN COTTON BALE.

(By our Staff Correspondent.)

This bale which is on exhibition at St. Louis, marks a departure from the ordinary method of compressing cotton. It is made in a machine of rather ample dimensions and requiring from eight to ten horse power; the ginned cotton, as soon as finished by that process, is blown into a large hopper forming the upper part of the Whitman machine, from the lower apex of which the fibre is drawn between parallel rollers which connect it into a broad sheet or mat. This mass of cotton is then fed continuously into the baling part of the compress where it falls in laps, and after two or more, at regular intervals, the plunger forces it into shape.

A feature of the machine is that the burlap covering is also fed continuously with the cotton, so that the bale and cover are really one. The ends are not part of this burlap feed but are added separately. The bales are bound by the ordinary flat steel banding, of which there are five to an ordinary bale of 500 pounds. Such a bale is 19 by 54 by 28



THE WHITMAN COTTON BALE.

inches, and has a density of 30 pounds per cubic foot. The bale is rectangular, of convenient size, easy to handle. It seems as if it would be easy to break open this bale without the usual damage, as the laps would pull out exactly the reverse of the way they were put in.

The capacity of the baling machine is such that with four or five men it will take care of the output of from four to six 80-saw cotton gins, baling the cotton as fast as the gins deliver it.

The machine is simple in its operation, constructed with due regard to the strength of its several parts, and not likely to get out of order.

At the present time the makers are not in a position to deliver the machines, but will be ready by December.

This bale seems to solve the problem of the cotton shipper and buyer; from its compactness, ease of baling and handling, it is likely to meet with favor from the warehouseman, railroad and steamship freight handler.

The Harris Furnace.

Careful tests of the Harris furnace with satisfactory results have been made by Prof. C. S. Brown of Vanderbilt University. He found that the furnace reduced the smoke to a minimum and effected an economy in fuel. This furnace is now being installed in different parts of the country and is believed to mark the solution of the smoke problem, while reducing the cost of fuel. The city of Indianapolis is setting a Harris furnace in one of its school buildings. One firm in Goldville, S. C., who has used the furnace for six months certifies that it not only dispenses with smoke, but results in a material saving of fuel.

Box Shooks.

There are but few textile mills at the present time that make their own cases from boards. The material comes to them in the form of shooks, the pieces being cut to size, and are nailed together at the mill, forming the packing cases. Tifft Bros., Produce Exchange, New York, have excellent facilities for supplying material for box shooks. They handle all woods that are used for packing

boxes and can obtain their supplies from fifteen different mills. They are thus enabled to furnish any kind of case desired. They are also prepared to supply crating strips and similar products including cloth boards. Textile manufacturers should investigate their products and prices before placing orders.

THE "NEVERSLIP" SPINDLE FOR COPS.

This is a device so simple that the illustration makes its operation clear without a word of explanation, and yet it remedies one of the most serious difficulties in the use of cop filling, the slipping of the cop on the spindle,

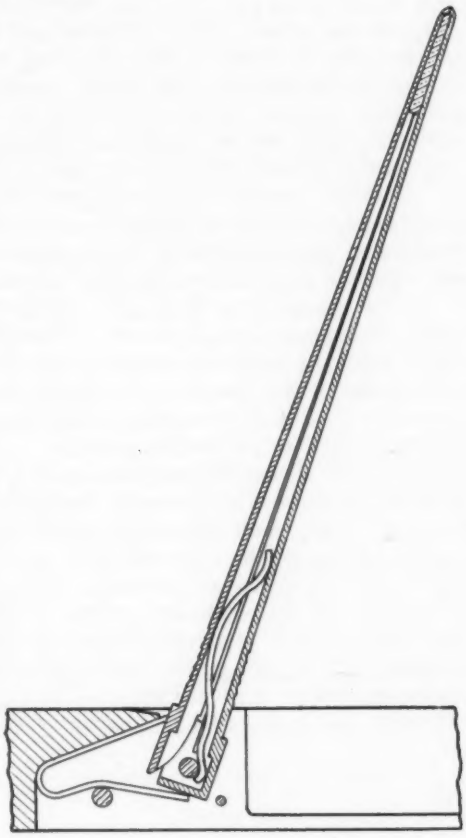


FIG. 1.

and consequent waste of material, loss of production and damaged goods.

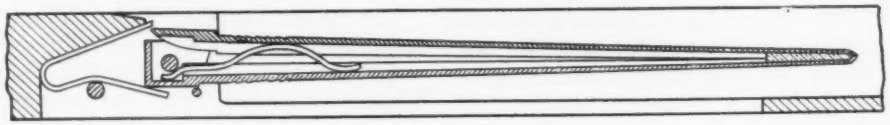


FIG. 2.

The spindle is split from the bottom to a point a short distance from the end. When in position to receive the cop, as shown at Fig. 1, the spindle is of such a size that the cop can practically be dropped over it.

When the spindle is lowered into the shuttle the two parts forming the base are expanded holding the cop firmly in place. The pressure is sufficient to hold the cop on a smooth spindle but the corrugations at the base of the spindle hold the cop still more securely.

The spindle contracts when again raised and the empty cop is easily removed.

It is a fact well-known to all manufacturers of textile fabrics that when the weaver is placing the cop on the spindle there is a certain amount of force required to adjust it. As the shuttle is thrown back and forth into the boxes with great force, the cop must be firmly fixed upon the spindle to prevent it from flying off. Thus the weaver must see that the cop is on tight.

In forcing on the cop, the weaver very often dislodges the yarn at once, thus creating waste at the outset. More often, however, the yarn is loosened, but to all appearances is solid on the cop. After being thrown back and forth several times across the shed, the yarn peels off, often causing a "smash," by having the loose yarn drag against the shed. Every manufacturer knows what these losses amount to during a year, in waste, bad goods and loss of time, especially on high grade fabrics.

With the "Neverslip Cop" spindle these troubles are avoided. The new spindle is manufactured by the Neverslip Cop Spindle Co., 415 Broadway, New York, and is the invention of Norbert Foerster, the secretary and treasurer. The invention is well protected by patents on all of the leading textile countries of the world. Orders for complete equipments have been placed by some of our leading mills. The spindle can be applied to old shuttles if desired. Further information concerning the simple and excellent device can be obtained upon application to the manufacturers.

Dyeing, Bleaching, Printing, Etc.

HYDROMETERS AND THERMOMETERS.

Although every dyer's manual and text book contains more or less complete information on these subjects, the question has been asked to explain the "systems" adapted for each class of instruments, and the advantages of any one over the others.

To undersand the value of an hydrometer, or the readings on the scale attached to it, it is necessary that the term "specific gravity" be known. As a matter of fact, hydrometers are only of value for determining the density or "specific gravity" of liquids. The specific gravity of all liquids is referred to distilled water, which is taken as a standard, the unit of comparison being 1,000 grains of distilled water at a temperature of 60 deg.

The correct specific gravity of any liquid can be determined only by means of bottles of special form and an accurate pair of scales, and this inconvenience led to the construction of the hydrometer, which depends upon the scientific principle that when a body floats on a liquid, the weight of the bulk of the liquid displaced is equal to the weight of the body floated.

The scale which should be in common use on all hydrometers is the true specific gravity scale, the readings of which would at once afford a means of calculating the weight in pounds of any known volume of liquid, but the scales in common dyehouse use are those of Beaume and Twaddle, the existence of which is the cause of some confusion.

To add to the confusion, there are two Beaume scales, one reading from 0 deg. to 70 deg., and is used only for liquids heavier than water, while another scale, reading from 10 deg. to 70 deg. is for liquids lighter than water, such as benzine, alcohol, ammonia, etc. Beaume constructed his scale for the heavy liquids by preparing a salt solution containing 15 parts of salt to 85 parts of water, both by weight, and then marking the scale 0 deg. where it sank in pure water, and 15 deg. to the point where it sank in the salt solution, then dividing this space into 15 divisions, and extending them along the stem or spindle.

For his hydrometer for liquids lighter than water, he used a salt solution containing 10 parts of salt to 90 parts of water, and fixing 0 deg. as the point to which it sank, and 10 deg. the point to which it sank in water, extending the graduations along the stem in the opposite direction.

The Twaddle is essentially an English scale, and should be relegated to oblivion. It was originally intended to serve only as a rapid, though grossly inaccurate means of determining the strength of crude muriatic acid. That it served its purpose no one can doubt, but aside from that use, it should never have gained any popularity. Twaddle scales as usually sold do not agree with one another; frequently the 24 on one scale is 2 or 3 points "out" when compared in the same liquid with the "24" on another spindle.

Most chemical manufacturers make use of the Beaume scale in their works, but when disposing of the manufactures to dyes, bill them according to the Twaddle scale.

As the Twaddle scale is frequently found in commercial literature, in many trade quotations, and in tables of strength, the rule for changing it into the more correct specific gravity equivalent is given, viz:

Multiply the degrees by 5, and add 1,000, thus:

Degrees Tw. $= 32 \times 5 = 160$. $160 + 1{,}000 = 1{,}160$ specific gravity.

And if this is intended to weigh such a liquid, all that is necessary to do is to measure out, say, ten volumes, when the weight will equal that of 11.6 times that of pure water.

The problem of thermometers is not quite so confusing. We have here to deal only with three scales, viz: Celsius (C), Fahrenheit (F) and Reaumur (R). Of this latter, the use of which is confined only to old Germans and in Russia, and may be disregarded as being of no use in this country, it is a matter

of interest that its zero is the point of freezing water, while 80 is the point of boiling water.

The Celsius or centigrade scale is the most satisfactory to use. It ranges from 0 (freezing water, or melting ice) to 100 (boiling point of water). It is used exclusively for scientific purposes, and is gradually displacing the Fahrenheit scale from technical establishments.

The Fahrenheit scale, much used in England and the United States, is the popular scale for temperature recording, being the standard of the Weather Bureau. The zero (0) of this scale is 32 degrees below freezing, that is, 32 degrees is the freezing point, while 212 degrees is the boiling point of water. It will be readily seen why it is desirable to abandon such a scale and adopt one more in accord with modern ideas of neatness and exactness.

However, as occasions frequently arise when it becomes necessary to change the readings from one scale to another, the formulae are given.

1. Centigrade into Fahrenheit: multiply by 9, divide by 5 and add 32.

2. Fahrenheit into Centigrade: subtract 32, multiply by 5, and divide by 9.

Parallel tables of the hydrometer and thermometer scales are now so plentiful in all trade publications, or in the general line of hand books that these rules may appear unnecessary, but it may be found very useful to remember them.

An Improved Potato Starch.

International Prize Starch is the name of a new potato starch brought out by the Arabol Mfg. Co., 100 William St., New York, well known to our readers by their excellent sizings and starches. For medium and fine yarns it offers several advantages over the domestic and imported potato starches used heretofore. As compared with them the International requires very little softening, it is very smooth and slippery on the yarn, is more soluble and more transparent. It cooks thinner.

For Egyptian warps, for mercerized and colored yarns that need sizing it means a great improvement on the old-fashioned potato starch.

It penetrates the yarn and lays the fibre, making strong, smooth-sized warps. At the same time it goes further than the old style of potato starch.

COTTON WASH FABRICS.

From present indications this class of fabrics is destined to increase in popularity and to continue with the fashionable dress and shirt waist materials for a long time.

The forerunners of this group of fabrics did not meet with pronounced success on account of the fugitiveness of the majority of dyes used, but as experience was gained and other dyes were substituted, the qualities of the fabrics increased so that at the present time it is quite possible to dye the yarns beautiful and fast shades that will remain "fast" almost as long as the goods hold together.

TWO CONDITIONS IMPOSED.

Aside from all other conditions that might, and frequently do arise in the manufacture of these fabrics, there are two that are of most interest to the dyer for it is he who must explain almost every shortcoming in the finished material. These conditions are: (1) When soaped the dyes used must not bleed into adjacent white yarn, and (2) The final shades must not fade.

The former of these conditions is more easily met than the latter, because the dyer has it in his power to color the cotton to its maximum capacity consistent with the depth of the desired shade, and then to soap down and remove any excess of color that is always present in fresh dyed material. This one fact alone explains the very great difficulty explained by professional "shade matchers" who match the given shade in a finished piece of wash fabric, and when the dyer attempts to duplicate on a large scale the result so obtained he fails to secure the shade, the shade matcher usually overlooking the several intervening and highly important processes that, though not dyeing processes by any means, materially aid giving the proper shade.

Regarding "non-fading" shades, the usual test as applied in the color laboratory is far short of the actual conditions of wear, exposure and the laundry. While there are a few dyes that when properly applied to cotton do stand exposure, etc., so well that colorists regard them as "fast" dyes, the great majority of dyes that are used in dyeing cot-

ton do not receive this technical distinction, and consequently cannot be regarded as "fast."

There are a limited number of dyes that are much used to produce fast and bright shades on cotton goods, but it is doubtful whether any two of them have the same resisting properties to the action of water, soap, light and wear, so that the dyer is at a disadvantage when directed to produce shades that are ablsolutely "non-fading." While the experience of the dyer is of great value in applying the colors to cotton, it must not be forgotten that in this age the dyer is not a dye or color manufacturer, but a skilled workman who applies the products of the chemical works, accompanied by the printed recipes, toning as may be necessary to obtain a given shade, with dyes usually belonging to the same chemical group.

CHOICE OF DYES FOR WASH FABRICS.

Three classes of colors are at once available:

1. Direct dyeing colors. (Phenedines, etc.)
2. Mordant or basic colors.
3. Diazotized and developed colors.

Direct Dyeing Colors. With few exceptions this group of dyes is not to be recommended for this class of work because they will not resist prolonged washing with soap. If the dyer of the goods was assured that the finished fabric would be washed only with neutral and otherwise pure soaps at a moderate temperature, and then rinsed out in tepid water and dried in the shade—not bright sunshine—then these easily applied dyestuffs could be more largely employed.

However, there are a few browns, blues, pinks, etc., that do find considerable field, and on account of their other good qualities the process of applying them is given.

For the very lightest shades, dye with

Soda ..... 1½ per cent.
Phosphate of soda .... 4 per cent.

and dye at a temperature not exceeding 120° F. This and other dyeing temperatures is of importance, and should be marked on the finished fabric so that in subsequent washing no higher temperature should be employed.

Light shades may also be dyed in a bath prepared with:

Soda ..... 1½ per cent.
Soap ..... 3 per cent.

Medium shades may be dyed with:

Glauber's salt ... 7 to 10 per cent.
Soda ..... 1½ per cent.

The temperature may be here carried as high as 200° F.

Dark shades are dyed with:

Glauber's salt .. 20 to 25 per cent.
Soda ..... 1½ to 2 per cent.

The concentration of the bath has much to do with the results of the shade. If the bath is of ordinary volume and density the shade will be weaker than if the volume is decreased and the density increased. Attempts have been made from time to time to prescribe proper working rules regulating the relative proportions of dye baths to the amount of yarn to be dyed, but they were found to be of little service, except for laboratory trials, where all tests must be uniform.

Mordant or Basic Colors are by far the most satisfactory for all classes of cotton wash fabrics, for the reason that if the mordanting in the first instance is properly done there can be no question regarding the dyeing. By proper mordanting is meant the fixation of the quantity of tannic acid with neither more nor less antimony salt than is required, and to wash thoroughly after mordanting and before dyeing. It is also supposed that the mordanting is being done for one particular shade or series of shades, the mordant value of each being the same, within certain limits. The evils of over or under mordanting are too well known to need mention here.

CHOICE OF TANNIN.

Except for heavy or even medium shades of any brightness the choice of the practical dyer will always be for pure tannin in either crystal or powder form, and next for decolorized sumac extracts. With these products and on bleached or unbleached goods, he can always obtain the brightest shades, while with ordinary grades of sumac extract only flat shades can be obtained.

According to the depth of the shade desired, prepare the wetted-out yarn with

Tannic acid ..... 2 to 5 per cent.

allow to steep from 12 to 14 hours, entering hot (not boiling) and allowing to cool down in the mean time, lift, squeeze, and fix in a fresh cold bath containing

Antimony salt..1¼ to 2½ per cent.

wash in this solution for one-half hour. Wash well so as to insure complete removal of all antimony salt or antimony tannate not actually fixed on the cotton. Neglect of this very necessary point will surely lead to dyeings that stain white or are otherwise imperfect.

Instead of the above quantities of tannic acid, from 10 to 20 per cent. of sumac extract can be used.

Tannin mordanted cotton should be dyed as soon after the mordanting as possible, for should it dry out, even if only slightly, these dried threads will take up color only imperfectly and uneven results will be obtained.

THE DYE BATH.

The composition of the dye bath depends upon the nature of the dyes used. As a rule the average line of mordant colors will go on the yarn most completely at temperatures varying from cold to 150° F. The proper method to pursue is to dissolve the previously weighed color in water, adding it in successive portions to the bath, gradually increasing the temperature until 125° F. is reached, and then maintaining this temperature until fixation is complete, and no excess of dye is apparent in the dye bath. It may be advisable to add to the dye bath a small quantity of alum or acetic acid, say from 1 to 2 per cent. This is found to exhaust the bath more completely. Chemical reactions proceed at rates peculiar to each specific case, and it is unwise to attempt to force the union taking place between a basic dye and a metallic tannate if the best results are wanted.

WASHING AFTER DYEING IS IMPORTANT.

As washing after mordanting is an absolute necessity, so is washing after dyeing. Unless the cotton skeins or warps are thoroughly freed from all excess color—unobservable at the time, possibly—serious consequences will result. The washing should be effective, not that a very great volume of water should be used but a quantity in two or three changes so that the last change will show but a bare tint when viewed on a white china hand bowl.

BLEACHING.

For the majority of shades, bleached yarn is necessary, and this implies that only the very best mordanting and dyeing materials are to be employed. The only bleaching process practically available is the "chloride of lime" bleach. After bleaching at say 2° Tw., sour and wash effectively to remove all traces of either lime or acid so that the tannin or dyes have a fair chance. Occasionally the dyer has requests for dyes that will withstand chlorine bleach, the object being to dye the yarn first such shades as may be desired, then weave it into the goods, and bleach and finish afterwards.

However desirable this may be, at the present time it is not commercially possible for the usual combination of colors used for cotton wash fabrics.

USE OF MERCERIZED COTTON.

Had it not been for the valuable properties of mercerized cotton, it is doubtful whether this class of fabrics would have become as popular as they are. To the dyer, the variety of cotton offers no obstacles in dyeing, the processes being the same as for ordinary skeins. Owing to its stronger affinity for the direct dyes, it becomes unnecessary to dye it separately if a shade is to be matched on it against plain cotton.

FINISHING THE WOVEN GOODS.

During the various processes through which the yarns pass, including the weaving, they take up particles of dirt, oil, etc., which must be removed by washing with a soft neutral soap, and in a temperature not exceeding 125° F. This passage through a tepid soap bath not only loosens and removes all mechanical dirt, oil, etc., but likewise removes all excess of color that would otherwise work loose with dampness and stain the adjacent white threads in the fabric.

The fabrics are thus washed a sufficient length of time to enable the dyer to be reasonably sure that there are no free particles of color on the pieces, and in order to withstand this treatment, the dyer has had to resort to the necessity of slightly over-dyeing

his warps and skeins, trusting to this warm soaping to reduce the dyed color to the proper shade.

It stands to reason that an indefinite number of such soapings and launderings will, in time, materially influence the depth of shade, and the fallacy of a dye "fast to soaping" becomes at once apparent.

TO SUMMARIZE.

Maximum fastness to light and washing with soap depends upon thorough washing after each operation in sequence, and to select such dyes as are found by trial to yield the proper shade in combination or alone, and to subject the finished fabric to a thorough soaping at a temperature not exceeding that of the highest temperature used in dyeing, and finally for the wearer, under no circumstances allow delicately tinted madras or other cotton wash fabrics to be scalded, or washed with soaps containing caustic, or strong with carbonated alkalies.

DYE TESTING.

The examination of mill supplies, more especially the dyestuffs and chemicals that are consumed in the coloring department is a matter of growing importance, alike to the consumer and the seller.

Most mills exercise no control over purchases, relying rather upon the skill of the buyer and the keenness of the dyer to detect any shortcomings, while on the other hand there are a few mills that have adopted the method of exact test, and regard the results obtained as ample compensation for the outlay in salaries and cost of maintaining the laboratory.

There was a time when the dyer regarded the chemist with suspicion and distrust, entertaining the idea that he was placed in the mills to "find out" the secrets of the dyer, but as this feeling wore off in time, the position of the chemist broadened, and today he is not merely an analyst, but rather a textile technologist, who of necessity must keep pretty near abreast of the times in his chosen field.

Dye testing in a large mill resolves itself into two phrases, first, the tinctorial, where the color values are determined, and second, the analytical, where the composition of the substance examined is determined.

In testing dyes the first process is to determine the depth of color and shade against an existing standard with a fixed price. For this purpose every mill undertaking tests, should keep in proper bottles, known samples of all their dyes, against which all future shipments should be checked. This checking is not a matter of guesswork or hap-hazard manipulation, but demands care equal to that of any chemical operation. Parallel dyeing should be made on proper material, according to the nature of the dye, together with a "cost test" so as to ascertain the money value of the shipment of dyestuff, and its tinctorial value for dyeing purposes.

The preliminary test of an aniline dye should alway include a test by blowing on wet filter paper so that the nature of the mixture—should it be such—can be readily detected. Sometimes a dyer will buy a standard color for several months, and uses it to good satisfaction, when, suddenly and without warning, a change is noticed in the results which cannot be at once accounted for, during which time there is serious damage, due to confidence in a dye that had never caused serious trouble. When referred to the chemist, it is found that the mixture is entirely different from that of the check sample, with the result that the components react differently when the dyed goods reach the finishing or some other department of the mill.

In all such cases the dyer is blamed, while the compounder or mixer of the dye's ingredients should have advised the mill beforehand, so as to enable the goods to pass along under closer attention. Few dye people outside of mills have any idea of the amount of trouble that a slight change in the composition of a dye will cause, and for this reason they should meet the mill management and appraise them of any unavoidable alteration in the standards. When a mill is working on a fixed line of goods for a season, and it has adopted certain lines of colors, it is a very serious matter to meet with some condition that necessitates a departure from the processes or methods originally laid out while the sample goods were going through.

Fluctuations in the quality of a dye, more

especially the anilines, always affects the dyeing power, and should never be overlooked by the chemist. While a difference of even three or five per cent. in the quantity of adulterant may not affect the shade as dyed, yet it is regarded as unsafe to trifle with this feature of the mixture.

A very great mistake on the part of many so-called shrewd buyers is to purchase colors on account of cheapness. for while this method might suffice for supplies of the nature of nails, belting, or even a car load of lime for mortar, etc., it is a very unsafe one to follow when dyes are under consideration.

While pure dyes of high strength cost very much more than other standards, they are by all means the most economical to use, as they offer less chance for the price to be played with. But, on the other hand, there are but few dyers who really know how to make proper use of such strong colors, and here again, trouble might follow.

Where a dyer knows his dyes, knows thoroughly the possibilities and limitations of each, then it would be safe to work with a few of these high standards, and within certain limits produce in the dye bath, the compound shades that the chemist of the dyefirm usually does in compliance with the demands of the dyer who wants his dyes ready-mixed, like the house painter, who simply shows his prospective customer a standard line of paints, issued free by all the large paint firms, who makes the selection, and the painter is not called on to use any skill whatever,—only paint. This parallels the duties today of many dyers, who, when they have a shade to match, turn it over to one of the dyestuff houses where it is "matched," and the dyer orders the dye in a few days by number, or otherwise, instead of exercising the proper function of a dyer and matching it himself.

Shade matching, as practised today, is the result of imitation, a certain mill may make a specialty of a particular line of goods and another mill desires to enter the field, not necessarily with a line of its own creation, but with imitations—not only of weave, stock, etc., but—of shades; consequently it is very essential that it should have the same color, to produce which recourse must be had to the skill of the color chemist.

From the mill standpoint, the chemist exercises control over the shipments, ascertains their quality, strength, shade, etc., and for this he must be equipped with a laboratory. At present, due to the widening of the scope of textile fields, textile schools are giving much attention to textile chemistry, but at the best their facilities are far from complete, lacking, in a majority of instances, the means of instructing in some of the most essential studies. Of course, in time, this will be remedied; not by textile schools, however, but rather by schools of Technology, where the atmosphere is more conducive to a thorough study of the theories.

Shade matchers—boys or young men who simply duplicate shades by simple or complex dyeing operations—cannot be rightfully termed textile chemists, and to whom the chemical testing of coloring matters, their properties, physical and otherwise, is as a closed book.

MILL SOAPS.

We desire to call the attention of our friends in the Textile Trade, who are users of soap, to the advertisement in this issue of Allen, Sherman & Co., 153, 155 and 157 Classon Ave., Brooklyn, N. Y., who, although but seven years in business, have succeeded in building up a very large trade for their castile soaps, as well as their potash soaps, with some of the largest manufacturers and dyers of silks and also with the woolen trade. Their claim that they made neutral soaps only containing far less moisture is a strong inducement, and backed as it is for absolute purity by a chemist test, leaves nothing to be desired.

They report that as dull as trade has been in the textile world for some months past, they have had no dull season, but, on the contrary, have been busy to the full extent of their capacity.

We bespeak for them a trial order, feeling confident that the soaps made by them will meet with your approbation.

A DYEING MACHINE.

A dyeing machine for loose stock, shown in the accompanying illustrations, has recently been patented in this country. It has for its object certain improvements by which the material operated upon may be treated in a tank, vat, or other receptacle and expeditiously discharged therefrom.

Fig. 1 represents a vertical transverse section, partly in side elevation, showing the supplemental bottom in its lowest position with the material to be dyed resting thereon; Fig. 2, a like view showing the supplemental bottom raised to exert pressure on the material to affect its density; Fig. 3, a like view showing the supplemental bottom raised to a greater extent to express the dye liquor from the dyed material; Fig. 4, a like view showing the supplemental bottom raised to its full extent to expel or discharge the dyed material from the tank; Fig. 5, a like view on an enlarged scale, showing the overflow-chamber and the liquor-return pipe; and Fig. 6, a like view showing one of the clamps and the cover on an enlarged scale.

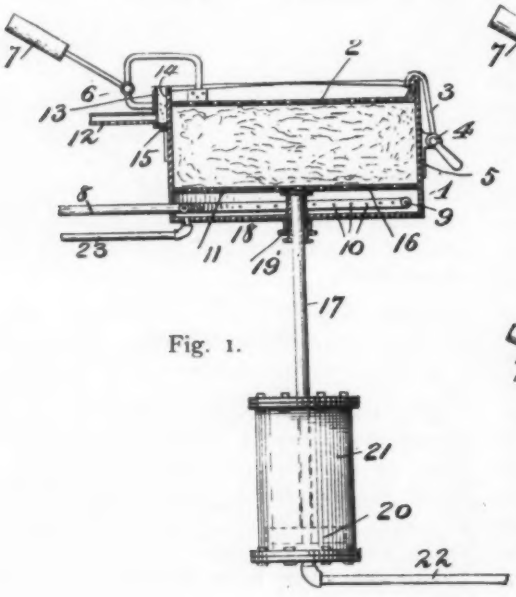


Fig. 1.

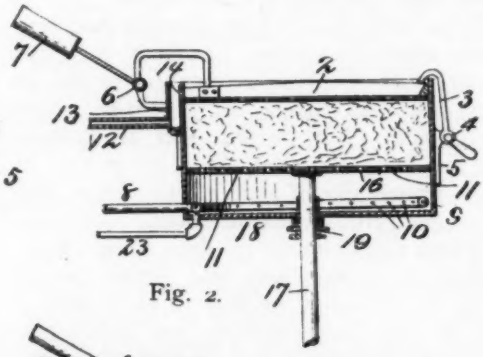


Fig. 2.

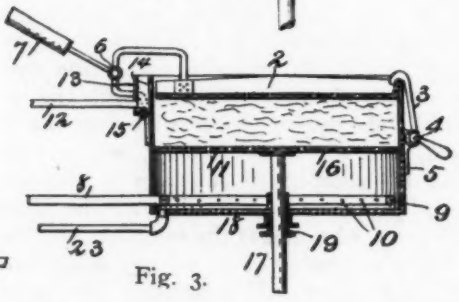


Fig. 3.

Reference being had to the drawings and the designating characters thereon, 1 indicates a tank, vat, or other receptacle in which the material is treated; 2, a perforated or foraminous cover secured in the tank by clamps, 3, of which only one is shown, or by any suitable device for the purpose. The clamps, 3, are pivotally connected, at 4, to a lug, 5, on the tank, and the cover is provided with hinged joints, 6, one on each side of the transverse centre of the tank, only one being shown on the drawings, and each hinge is provided with a counterweight, 7, to sustain the cover in its raised position, Fig. 4.

8 indicates the dye-liquor-supply pipe communicating with a pump, (not shown), enters the tank and encircles the interior thereof, and forms an annular feed-pipe, 9, provided with numerous perforations, 10, through which the liquor is evenly distributed in the vat under the supplemental bottom, 11.

12 is the liquor-return pipe, which communicates with the suction-pipe of the pump in the usual manner of connecting the pump and pipes for this class of machinery. The pipe, 12, is connected to an overflow pocket or chamber, 13, supplied through a port or opening, 14, in the wall of the tank above the cover, 2, when in position in the tank. Any number of these pockets may be used as

found desirable to carry off the overflow liquor and to maintain circulation thereof through the tank and the pump.

In the bottom of the pocket, 13, is a screw-plug, 15, to facilitate removal of any solid matter which may accumulate in the pocket.

The supplemental bottom, 11, is provided with perforations or openings, 16, throughout its area, is provided with a rod, 17, extending through the bottom, 18, of the tank. the stuffing-box, 19, and may be connected to the piston, 20, of a fluid-operated motor having a cylinder, 21, and a combined supply and discharge pipe, 22, controlled by a suitable valve.

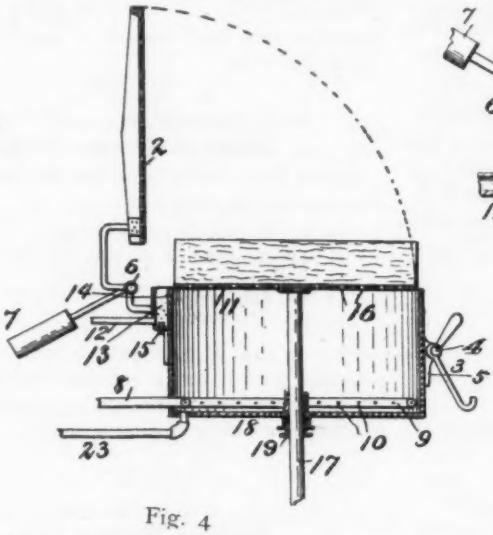


Fig. 4

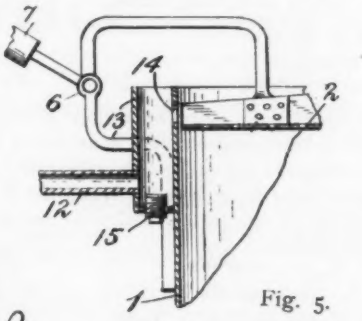


Fig. 5.

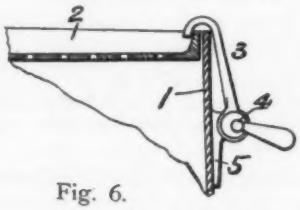


Fig. 6.

It is obvious that other means may be employed to raise and lower the supplemental bottom without departing from the spirit of my invention.

23 indicates a pipe for drawing off the liquor after the dyeing of the material has been completed and the liquor is returned to its original source of supply.

In the operation of my invention the material to be dyed is placed upon the supplemental bottom, 11, the cover, 2, lowered into position in the tank and secured by the clamps, 3, when the supplemental bottom is raised to compress the material between the cover and the bottom to effect the degree of density of the material found most desirable to secure the best results of the dye liquor in passing through the material. The pump is then put into operation and the dye liquor forced through the material, the perforations in the bottom, 11, and cover, 2, and returned through pipe, 12, to the pump to maintain circulation of the liquor. After the dyeing has been completed the liquor in the tank is returned to its source of supply through pipe, 23. The bottom, 11, is elevated to express the liquor from the dyed material, and then the cover, 2, is released and raised to its elevated position, when the bottom, 11, is further elevated to raise the material thereon to the upper end of the tank, so that it may be moved bodily from the bottom to any suitable device for conveying the material.

WEIGHTING SILK.

Paul Heermann has taken out a German patent for a process of silk weighting, which is said to give a heavier weighting than the usual tin process. The weighting liquid is prepared by mixing one part of tin perchloride of 106 degrees Tw. with 1/4 part of bisulphite of soda at 70 degrees Tw. To this mixture add sufficient caustic soda to give an alkaline reaction with phenol phthalein. The silk is worked in this solution, then wrung out and rinsed. It will take up 22.9 per cent.—Textile Mercury.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Receipt No. 129.

Brown on Woolen Yarn.

Alizadine Brown W on 100 lbs. woolen yarn. Prepare the dye bath with

3 lbs. Alizadine Brown W previously dissolved in boiling water.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter the wool cold, raise to a boil in three-quarters to one hour, boil one-half hour and if the bath is not exhausted add up to 1 lb. sulphuric acid and boil one-quarter hour longer. When the bath is exhausted add ½ to 1½ lbs. Bichrome and boil one-half hour longer.

Recipe No. 130.

Green on Cotton Yarn.

Thional Green 3 B on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thional Green 3 B.
(Thos. Leyland & Co., 53 India St., Boston.)
12 lbs. Sodium Sulphide Crystals.
10 lbs. Soda Ash.

When the above is thoroughly dissolved add

30 lbs. Common Salt.

Boil up the bath, enter the yarn and dye just at the boil for one hour.

When the dyeing is completed rinse well and immediately.

Thional Green 3 B possesses the characteristic properties of the sulphide colors and is fast to light, washing, and cross-dying.

Recipe No. 131.

Orange on Cotton Yarn.

Tetrazo Chlorine Orange R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Chlorine Orange R.
(American Dyewood Co., 156 William St., New York.)
30 lbs. Common Salt.

Enter yarn at 180° F., and dye at the boil for one hour.

Tetrazo Chlorine Orange R gives an excellent and bright orange and possesses the valuable properties of the direct cotton colors.

Recipe No. 132.

Blue on Worsted Yarn.

Anthra Cyanine D L on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Anthra Cyanine D L.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Sodium bisulphate.

Enter yarn at 160° F., and dye at a boil for one hour.

Anthra Cyanine D L is a level dyeing color, which possesses very good fastness to light, acids, steaming and ironing.

Recipe No. 133.

Green on Woolen Cloth.

Guinea Fast Green B on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Guinea Fast Green B.
(Berlin Aniline Works, 213 Water St., New York)
5 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 160° F., and dye at a boil for one hour.

Guinea Fast Green B possesses excellent leveling properties and yields dyeing of good fastness to alkalies, washing, stoving and light.

Recipe No. 134.

Black on Worsted Yarn.

Acid Alizarine Black S N on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Acid Alizarine Black S N.
(H. A. Metz & Co., 122 Hudson St., New York.)
10 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter yarn at 100° F., bring to the boil and dye at a boiling temperature for one-half hour. Then add enough sulphuric acid (one to three pounds) to exhaust the color.

When the color has been exhausted from the dye bath add

3 lbs. Potassium Bichromate

and boil three-quarters of an hour longer.

Acid Alizarine Black S N is easily soluble in water, exhausts well, is absolutely fast to rubbing, and possesses excellent fastness to all the common color destroying agencies.

Recipe No. 135.

Brown on Woolen Yarn.

Alizadine Brown Y on 100 lbs. woolen yarn. Prepare the dye bath with

3 lbs. Alizadine Brown Y previously dissolved in boiling water.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter the wool cold, raise to a boil in three-quarters to one hour, boil one-half hour and if the bath is not exhausted add up to 1 lb. sulphuric acid and boil one-quarter hour longer. When the bath is exhausted add ½ to 1½ lbs. Bichrome and boil one-half hour longer.

Recipe No. 136.

Seal Brown on Worsted Yarn.

Compound shade on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Domingo Chrome Brown G.
1 lb. Domingo Chrome Green W.
(C. Bischoff & Co., 88 Park Pl., New York.)
20 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter yarn when dye bath is at a temperature of 100° F., bring slowly to a boil, and exhaust the bath by gradually adding

3 lbs. Sulphuric Acid.

When dyeing is completed add

2 lbs. Potassium Bichromate

to the same bath and boil for three-quarters of an hour.

When applied in these proportions and according to this receipt an excellent shade of seal brown is obtained, which possesses excellent fastness.

Recipe No. 137.

Black on Cotton Yarn.

Diamine Fast Black F. on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Diamine Fast Black F.
(Cassella Color Co., 182 Front St., New York.)
30 lbs. Common Salt.
1 lb. Soda Ash.

Enter at 180° F., and dye at a boil for one hour.

Diamine Fast Black F is one of the fastest direct blacks on the market, and its fastness to light is excellent. Its fastness is increased by an after-treatment with Potassium Bichromate and copper sulphate.

Recipe No. 138.

Yellow on Worsted Yarn.

Chrome Yellow J on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Chrome Yellow J.
(Sykes & Street, 85 Water St., New York.)
1½ lbs. Potassium Bichromate.
3 to 5 lbs. Acetic Acid.

Enter yarn at a boil and dye at a boil for one hour.

Chrome Yellow J is one of a new coloring group and gives very satisfactory results when dyed in a single bath with Potassium Bichromate and Acetic Acid. It possesses excellent fastness to light, washing and fulling.

Note. We would call attention to the fact that this sample was shown in our June issue, but the recipe, No. 86, given with it contained an error. The recipe as given herewith is correct.

Recipe No. 139.

Reddish Brown on Cotton Yarn.

Katigen Red Brown R on 100 lbs. cotton yarn. Prepare the dye bath with

15 lbs. Katigen Red Brown R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
15 lbs. Common Salt.

Boil the bath well to insure complete solution of color, and then enter the yarn and dye for one hour at a boiling temperature.

Katigen Red Brown R gives a bright brown shade with a reddish hue, dyes level, and when after treated with Bichromate of Potash and Copper Sulphate is rendered somewhat faster to boiling.

Recipe No. 140.

Blue on Worsted Yarn.

Anthracine Chrome Blue F on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Anthracene Chrome Blue F.
(Cassella Color Co., 182 Front St., New York.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 110° to 130° F., bring to the boil and dye at the boil for one hour.

Allow the bath to cool somewhat and add

1½ lbs. Potassium Bichromate

and again boil for one-half hour.

Anthracene Chrome Blue F gives very fast shades of blue when used as a self color, and is

particularly well adapted to the production of compound shades. It may be applied upon chrome mordanted wool.

Recipe No. 141.

Tan Color on Cotton Yarn.

Dark Tan B 706 on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Dark Tan B 706.
(Berlin Aniline Works, 213-215 Water St., New York.)
20 lbs. Common Salt.

Enter the material cold without any salt, bring to the boil and boil 15 minutes before adding the salt. The boiling is then continued for 20 to 30 minutes, when the dyeing is completed.

Dark Tan B 706 gives a beautiful clear shade of tan and is of great value in the dyeing of hosiery, as the dyeings possess excellent fastness and the dyestuff goes on very evenly.

Recipe No. 142.

Brown on Cotton Yarn.

Tetrazo Sulphur Brown R G on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Brown R G.
(American Dyewood Co., 156 William St., New York.)
10 lbs. Sodium Sulphide.
1½ lbs. Soda Ash.
50 lbs. Common Salt.

Boil the dye bath well to insure complete solution of the color, then enter the yarn at a boil and dye at a boil for one hour. Rinse quickly in cold water and then wash thoroughly.

The above amounts are given for the first bath. It is advisable to keep a standing bath, in which case only about two-thirds of the quantity of color and sulphide is necessary and the addition of enough salt to keep the bath up to its original specific gravity.

Tetrazo Sulphur Brown R G gives a deep brown shade of excellent tone and fastness.

Recipe No. 143.

Black on Worsted Yarn.

Domingo Chrome Black D F B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Domingo Chrome Black D F B.
(C. Bischoff & Co., 88 Park Place, New York.)
10 lbs. Sodium Sulphate.
5 lbs. Acetic Acid (enough to exhaust color).

Enter yarn at 180° and dye at a boil until bath is exhausted, then add

2 lbs. Potassium Bichromate

and work one-half hour longer at a boil.

Domingo Chrome Black D F B gives an excellent shade of black, which is extremely fast to the common color-destroying agencies.

Recipe No. 144.

Yellow on Woolen Cloth.

Fast Yellow 2 S on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Fast Yellow 2 S.
(Sykes & Street, 85 Water St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 160° F., bring to the boil and dye at boil for one hour.

Fast Yellow 2 S gives a rich golden yellow of good tone and excellent resistance to washing and light. It has good penetrating properties, works well in combination with other acid colors, and is especially recommended for carpet yarns, heavy felts and woolen piece goods.

Color Cards.

Acid Alizarine Black; H. A. Metz & Co., 122 Hudson St., New York City.
Two samples of woolen yarn, two of raw wool, two of slubbing and three of woolen piece goods dyed with various percentages of Acid Alizarine Black S N, and S N T. One of the samples has white striping threads which are not colored by the dye.

Neutral Wool Black; Cassella Color Co., 182 Front St., New York City.
Two samples of cotton and wool union goods and two of silk and wool mixed goods dyed with Neutral Wool Black B and G.

Oxy Diamine Brown R N; Cassella Color Co., 182 Front St., New York City.
Two samples of loose cotton, four of cotton yarn, two of cotton piece goods and one of union goods dyed with different percentages of Oxy Diamine Brown R N.

Dyeings on Cotton Yarn; Berlin Aniline Works, 213 Water St., New York City.
A card showing fourteen samples of cotton yarn fast to cross dyeings.

Dyeings on Half Wool Material; Cassella Color Co., 182 Front St., New York City.
Thirty-two samples of half-wool material dyed various shades and discharged with Hyraldite.

*Wisconsin, Janesville. Operations have been resumed in the Rock River Cotton Co.'s mill, recently damaged by fire.

Mill News.

COTTON.

New Mills.

*Georgia, Barnesville. Operations will be started Sept. 15, by the Aldora Mills, formerly known as the Barnesville Mfg. Co.'s plant. The company has been incorporated with a capital stock of $125,000. J. W. Hanson will be superintendent of the plant, which will be run on mule spun cotton yarns, 8's to 24's. This plant is equipped with 9,777 mule spindles.

Georgia, Columbus. John T. Abney, of the Laurens Cotton Mills, Laurens, S. C., and G. Gunby Jordan, of the Eagle & Phoenix mills, are making arrangements to build a 10,000 or 20,000 spindle cotton mill here. The details of the plant are being considered.

*Georgia, Quitman. The No. 2 mill of the Atlantic & Gulf Mills has been completed. This plant will be used for spinning Sea Island cottons exclusively, and is equipped with 5,000 spindles.

Massachusetts, New Bedford. The Kilburn Mill has recently been incorporated here with capital stock of $600,000. Edward Kilburn will be president of the new company and Henry L. Tiffany treasurer. A plant of 50,000 spindles will be built.

*Massachusetts, Taunton. Work will start shortly on installing equipment of the Watuppa Mills, which they expect to have in operation early in the fall. The finest grades of cotton weaves will be made.

*Missouri, Carthage. Contract has been awarded for erection of the Carthage Cotton Mills, to T. C. Thompson, of Birmingham, Ala. This plant will have a capacity of 15,000 spindles and 450 looms, although but 10,000 spindles and 300 looms will be installed at first.

*North Carolina, Gastonia. Work has started on installation of the additional machinery (32,000 spindles and 840 looms) to be put in the Loray Mills.

*North Carolina, Marshall. The Capitola Mfg. Co. will install 5,000 spindles for manufacturing hosiery yarns instead of 1,500 spindles and 400 looms for cloth as was originally intended. Work is nearing completion on the building.

*North Carolina, Statesville. The Bloomfield Manufacturing Company has started operations in their new mill, making yarns from 60s to 80s. Plant is equipped with 4,000 spindles. A. B. Saunders is general manager of the plant.

Pennsylvania, Sellersville. A new mill, two stories, brick, is to be erected here for the Armure Tapestry Mill of Philadelphia.

*Pennsylvania, Wilkesbarre. Operations will start about the middle of next month in the Doran Lace Manufacturing Company's new plant.

*Rhode Island, Pawtucket. The Blackstone Webbing Company's new mill is in full operation. Plant is equipped with 40 looms.

*Rhode Island, Providence. The Rhode Island Lace Works, recently reported incorporated, with office in the Bannigan Building, have not fully decided just where the plant will be erected. George B. Frost is president of the concern and Chas. W. Shepard is manager.

*South Carolina, Greenwood. The new building of the Greenwood Cotton Mills is completed and work of installing machinery has been started.

*South Carolina, Marion. Application for a charter has been made by the Marion Cotton Mill, with capital stock of $100,000. W. Stackhouse, of Dillon, and W. J. Montgomery, Marion, are interested.

*Texas, West. The West Cotton Mills will soon be put in operation by a company recently organized. The capital stock will be placed at $100,000, with a working capital of $30,000 in cash. The company has been organized as the Brazos Valley Cotton Mills Co. W. D. Lacy and James Brock are among the directors. Albert Clifton will be superintendent of the plant.

*Virginia, Emporia. The Ashby Cotton Mill Co., of which T. A. Blythe, of Philadelphia, is president, proposes starting the plant September 20th.

Enlargements and Improvements.

*Alabama, Huntsville. The new addition to the Lowe Manufacturing Company's No. 1 mill will be 50 by 140 feet and will be equipped with 10,000 new spindles. Work will soon start on construction of building.

Arkansas, Monticello. The Monticello Cotton Mills Co. is installing an electric light plant.

Connecticut, Middletown. Plans are being prepared for a large addition to be made to I. E. Palmer's mill. The new building will be 30 by 50 feet, four stories, and will almost double the present capacity.

Connecticut, Moosup. General improvements will be made on the Cranska Thread Mill at this place. It is reported that another story will be built to the mill.

Connecticut, Taftville. Contract has been placed for erection of an addition, 100 by 75 feet, two stories, for the Ponemah Mills.

Georgia, Atlanta. Extensive improvements will be made to the Exposition Cotton Mills, which have let contracts for same. An addition will be made to the main building, providing about 100 by 275 feet of floor space, in which about 9,000 spindles and complement of looms will be placed.

Georgia, Egan. The Piedmont Cotton Mills have installed machinery for manufacturing canvas stitched belts.

Georgia, Thomson. The J. E. Smith Cotton Mfg. Co., which has been operating hitherto on yarns only, will increase the plant and install machinery for weaving. The new equipment will consist of about 5,000 spindles and 200 looms.

Georgia, West Point. The Lang Manufacturing Company has been incorporated with capital stock of $100,000, succeeding the Langley Manufacturing Co. The company now controls two mills, the Lanett (Ala.) mill and the plant at West Point, latter known as Mill No. 2. They now have 2,000 spindles, 1,000 twister spindles and 30 broad looms, with bleach and dye house. W. T. Lang is president of the company, E. Lang, vice-president and manager, A. C. Smith secretary, and W. H. Gass treasurer.

Massachusetts, Fall River. New engines are being installed in the King Phillip Mills, which it is expected will be ready to start up when strike is settled. It is proposed to stop the old pair in No. 1 mill, one pair in No. 2 mill having already been discarded. A new pump and condenser have been installed and a new filter, similar to the one in use in the Davol Mills, will soon be ready for operation.

Massachusetts, South Hadley Falls. A new office building, 40 by 40 feet, two stories, will be erected for the Hadley Mills, to contain general and private offices. Building will be heated by steam and lighted by electricity.

Massachusetts, Taunton. A dyeing machine is being installed in the new dyehouse recently erected for the Cohannet Mills.

New York, Patchogue. The Patchogue Manufacturing Company will soon start manufacturing carpet by a new weaving process which will greatly cheapen it.

Pennsylvania, Chester. T. I. Birkin & Co. are making enlargements to the plant and will employ a number of additional people.

Pennsylvania, Philadelphia. In order to increase their capital and expand their business. Messrs. Whiteley & Collier, 62d and Girard Ave., have incorporated their business under the name of the Whiteley & Collier Co. They manufacture curtains and draperies on 11 looms, buying cotton and mercerized yarns.

*Pennsylvania, Wilkesbarre. The Wilkesbarre Lace Mills, reported as contemplating enlargement to the plant, will build an addition 50 by 150 feet, three stories, brick.

Pennsylvania, Wilkesbarre. The Wyoming Valley Lace Works will soon begin work on an enlargement to the plant. Two stories will be added to the lower buildings and new machinery installed.

Rhode Island, Westerly. An addition 46 by 35 feet, two stories, is under construction for the Lorraine Mill. This will be used for purpose of increasing the carding and spinning departments.

*South Carolina, Belton. The Belton Power Co., recently reported incorporated, advise us that they are developing a water power and will generate electric power, supplying same to cotton mill at Belton and Williamston, these plants at present using water and steam. They will also light Belton and Williamston.

South Carolina, Darlington. The Darlington Manufacturing Company is reported as making arrangements to install additional spindles in the plant.

*South Carolina, Greenville. The Carolina Mills, recently reported to increase the capital stock to $100,000, will erect an additional building, 60 by 110 feet, two stories. They will install 160 looms for weaving output of present spindle equipment.

Mills Starting Up.

*Massachusetts, Boston. John C. Meyer & Co. have started operations in their new plant at Jamaica Plain.

Mills Shutting Down.

Connecticut, Hawleyville. The New England Lace Works, John Drew, proprietor, have been closed for the summer vacation.

Georgia, Hawkinsville. The Hawkinsville Cotton Mills have been closed on account of shortage of cotton. It is thought that the machinery will be put in operation again in about three weeks.

Indiana, Cannelton. The Indiana Cotton Mills have been closed. Operations will be resumed in about six weeks.

Virginia, Petersburg. All the departments of the Mattoaca Cotton Mill have been closed except the weaving department.

WOOLEN.

New Mills.

Canada, Ont., Forest Mill. Breeze's Mills, operating on tweeds, blankets and yarns, with one set of cards and three looms, which was burned out three weeks ago, will be rebuilt after the first of the coming year. The new factory will be entirely fireproof, being built of stone with concrete floor and steel roof.

*Massachusetts, East Douglas. The Schuster Woolen Co. will start operations in their new plant this fall. Plant will be equipped with 7 sets machinery.

*Massachusetts, Franklin. The Mine Brook Mfg. Co. will start operations in their new mill about Nov. 1st.

Massachusetts, Uxbridge. Twenty new looms will be added to the C. A. Root & Co.'s mill at Wheelocksville. They will be used for manufacturing cotton and worsted goods and will be operated under name of the Uxbridge Worsted Co., with C. A. Root as agent and manager.

*Massachusetts, Westboro. Work has started installing the machinery in plant to be operated here by the Westboro Carpet Co. Company has been incorporated with capital stock of $100,000. W. J. Hogg is interested. The goods will be sold direct.

*Oregon, St. Johns. It is expected to have the new woolen mills ready for operation by January 1, 1905. Work has been started on the foundations for the main building.

*Pennsylvania, Greenville. We have been advised by the Pearce Mfg. Co. that they have decided to rebuild their plant but have not as yet secured location.

Pennsylvania, Philadelphia. Messrs. Bush & Terry, both gentlemen until lately employees of C. H. Masland & Son's Amber Carpet Mills, are about to start up in the manufacture of art squares at 2766 Ruth St., where they have rented the one-story and basement building in which they will put 6 looms, 3 Crompton & Knowles looms now on hand and being erected, together with one 24-spindle winder and one 24-spindle spooler and a 48-inch warping mill. The product of the plant will be sold through a commission house.

Enlargements and Improvements.

California, Napa. The California Woolen Mills are increasing the capacity of the plant.

*Connecticut, Norwich. The new steam plant at the Yantic Woolen Company's mill has been completed. A new chimney, 100 feet high, with five-foot flue, has been built and a new pump house. Four 150 h. p. horizontal boilers have been installed.

Connecticut, Talcottville. Talcott Bros.' mill has been closed for two weeks. During shut down some needed improvements will be made. A small addition will be built to the card room, a new spinning mule installed and a new flume built.

Maine, Kezar Falls. Preparations are being made by the Kezar Falls Woolen Mfg. Co. to build an addition, 70 feet long, to the plant.

Massachusetts, Franklin. An office building, 20 by 30 feet, will be erected by the Franklin Yarn Mfg. Co.

Massachusetts, Holliston. A new dye house is to be built for the Darling Manufacturing Company. They are also installing a new boiler in the mills here.

Massachusetts, Holyoke. The Farr Alpaca Company is making some repairs on its dyehouse in the yard of mill No. 2. The building is being extended about 25 feet, to give needed room.

Massachusetts, Indian Orchard. Twenty additional (Crompton & Knowles) looms are to be installed in the Indian Orchard Worsted Company's plant. They will replace a number of old machines, making fancy worsteds.

Massachusetts, Jefferson. An addition, 40 by 85 feet, four stories, is to be erected by the Jefferson Manufacturing Company.

Massachusetts, Lowell. The Belvidere Woolen Mfg. Co. is installing two new Corliss engines in the No. 2 mill.

Massachusetts, Pittsfield. An addition, 30 by 40 feet, is being built to the Tillotson Mill. This concern is now operating the spinning and combing rooms nights.

Massachusetts, Pittsfield. A new two story building, 100 by 60 feet, to be used for a dressing room, will be built by the Pontoosuc Woolen Company. The ground floor will be devoted entirely to making warps, while spooling will be done on the second floor.

Massachusetts, Smith's. Four new jacks are being installed in the Swift River Co.'s mill.

*Massachusetts, West Millbury. W. W. Windle & Co. have closed their wool dyeing and scouring mill, preparatory to removing to new mill at Millbury.

Michigan, Flint. The Flint Woolen Mills have installed an additional set of 60-inch cards.

Michigan, Hastings. The Hastings Wool Boot Co. has recently added three new sets of cards to the plant and will have them in operation soon.

Pennsylvania, Philadelphia. The Brookside Mills, 2636 Mascher St., of which Robert T. Shaen and Thomas Whitehead are the proprietors, report that business with them is very good. In order to start up their mill on fall goods it was necessary to rent 16 outside looms to work on spring orders which call for immediate delivery. They operate 22 broad looms on worsted and cotton goods, which are sold direct. Mr. Whitehead is the superintendent and buyer.

Pennsylvania, Philadelphia. James Pollock & Son, Dauphin and Tulip Sts., manufacturers of granite, Venetian stair carpets on 60 looms, have had plans prepared for additions to their boiler and engine house on property 18 by 71 1/16 feet recently purchased by them.

Pennsylvania, Philadelphia. C. H. Masland & Sons, proprietors of the Amber Carpet Mills, at Amber, Westmoreland and Collins Sts., are about to erect a one-story pump house of brick, 8 by 14 feet, to cost about $1,400.

*Rhode Island, Bristol. Charles B. Rockwell, who recently purchased the Namquit property, contemplates using the same for spinning, and if suitable arrangements can be made with a first-class party to manufacture worsted goods for men's and women's wear, part will be equipped for that purpose.

Rhode Island, Oakland. The Coronet Worsted Co. is moving five or six houses and will erect a new mill for making clays and serges on site vacated. Plant will be equipped with 50 English clipper looms.

*Rhode Island, Olneyville. The new addition to be built for the Earnscliffe Mill will be 220 by 58 feet, two stories. The company contemplates removing the dressing, winding and spooling departments to the upper floor of the new building and installing about 40 additional looms. Construction work will start in a few days.

*Tennessee, Athens. The Athens Woolen Mills have let contract for erection of a dyehouse and picker room, to be made with other enlargements and improvements.

*Tennessee, Knoxville. The increase of capital stock by the Knoxville Woolen Company is for working capital and not to be applied to any additional buildings or machinery.

*Virginia, Fredericksburg. The Melville Woolen Mills have been closed for two weeks for purpose of installing a new turbine water wheel to increase power. A new one story addition to the carding and spinning room has recently been completed. A new dynamo replaced the older one of smaller capacity and a new cloth drying machine put in. Operations will be resumed with full capacity as soon as improvements have been completed.

Mills Starting Up.

Connecticut, Stafford Springs. The Central Woolen Mills has resumed operations.

*Maine, West Buxton. W. & R. Brier, who have recently leased the Berryman Mill, will start same up on men's wear. Mr. Roy Brier was formerly superintendent at Seneca Falls and W. Brier, boss dyer at the Old Town Woolen Co., Old Town, Me.

Maine, Dexter. The North Dexter Woolen Mill has been leased by Arthur Abbott of the Amos Abbott Woolen Co., and another party, who will start it up in a short time.

Maine, Sangerville. Operations have been resumed in the Sangerville Woolen Company's mill after two weeks' shut down. New sills under the water side have been put in and other repairs made.

*Missouri, Sedalia. The Sedalia Woolen Mill, recently purchased by M. D. Moore and others will be operated as the Sedalia Woolen Mill Co. Operations will start August 10th, making cassimeres, flannels and blankets. They propose incorporating with capital stock of $50,000 and adding another set machinery and start a pants factory with capacity of 20 dozen pants per day. The plant is now equipped with 1 set cards and 7 looms, with dye house.

Pennsylvania, Aston Mills. The May Manufacturing Co., which recently shut down for a few days, and which is now running again, has for its superintendent Mr. S. J. Greer, formerly connected with the Yorkshire Worsted Mills in the same town.

Pennsylvania, Chester. Geo. C. Hetzel & Co. have resumed operations in their woolen mill on full time.

Pennsylvania, Clifton Heights. Operations have been resumed in the Kershaw Worsted Mills.

Pennsylvania, Millville. The Enterprise Worsted Company's property has been purchased by A. T. Skerry, Jr., of A. T. Skerry & Co., New York. Plant will be operated under name of the Enterprise Worsted Mills, making 2 ply 14s and 2 ply 32s. These mills have been idle for the past two months, pending settlement of the estate.

SILK.

New Mills.

*Connecticut, Putnam. The new silk throwing plant started here by Messrs. Hammond and Rich will be operated under the name of the Hampton Silk Company.

*New York, Cortland. The Cortland Silk Mill will start operations during this month.

*New York, Hornellsville. The Huguet Merrill Company expects to have their new plant, now under construction, ready for operations in about two months. They will make gauze chiffons. Will sell goods direct.

*Pennsylvania, Lansford. The Century Throwing Company's new mill will be started about the middle of this month, employing 250 people.

Pennsylvania, Philadelphia. The Art Fibre Company, Inc., with plant at southwest corner 5th St. and Columbia Ave., and main office 1017 Race St., manufactures artificial silk, operating 10 frames. Use steam power. Goods are dyed and finished at the mill. H. Bernstein is president of the company, Russell Murray (100 Grand St., N. Y.), treasurer, and Clement H. Scheibner, superintendent. Sell direct.

Pennsylvania, Scranton. A large silk mill, for which estimates are being made, is to be erected on South Washington Ave., by the Renard Company, of Taylor, Pa. A barn, 25 by 100 feet, two stories, brick, will be remodelled for the mill and engine and boiler houses erected. Additional property has been purchased for purpose of extending the building in the near future.

Enlargements and Improvements.

Connecticut, Shelton. The Specialty Weaving Company is having plans made for the erection of an addition. A new building, four stories, will be built.

Massachusetts, Athol. D. E. Adams is making repairs to the plant, also erecting a new bleach house, 20 by 10 feet.

New Jersey, Paterson. The Wm. Strange Co. has purchased ground upon which a row of frame dwellings stand and after removing the buildings will erect an up-to-date dye house. Plant will have sufficient capacity to take care of all the work of the company.

New Jersey, Paterson. The Hill Silk Company has completed erection of an addition to the plant.

New Jersey, West Hoboken. Extensive additions are being made to Schwarzenbach, Huber & Co.'s plant.

New York, Hornellsville. The Merrill Silk Co. has closed the mill for one month. They will remodel the building and make other improvements to the plant, starting up again in September with about double the present force of operatives.

Pennsylvania, Danville. About 3,000 additional spindles have been installed in F. Q. Hartman's silk mill. The plant was closed for a few days for purpose of putting in the machinery.

Pennsylvania, Philadelphia. The Pine Tree Silk Mills Co., Coral and Adams Sts., report a very active business for this time of the year in the manufacture of broad silks and ribbons, which they sell direct. They have recently added quite a number of Automatic High Speed Ribbon Looms and new box looms for their broad silk department. The mill is superintended and managed by John Best and run by steam.

MISCELLANEOUS.

New Mills.

Maryland, Baltimore. A new building, 31 by 176 feet, three stories, will be erected for cloth sponging plant for Julius Rothholtz.

Pennsylvania, Philadelphia. The Integrity Dyeing Company has recently started up in the dyeing of fast black and colors on hosiery. The company has started the building of a new plant at 406 and 418 Memphis St., which will be three stories high when completed, the ground floor being roofed over and ready for operation and in which they have already installed machinery, with orders now being given out for other machinery, which will be put in operation as soon as delivered. Mr. Frank Fisher, formerly connected with the Franklinville Dye Works, is the superintendent. The plant has a capacity of 4,000 pounds a day.

Pennsylvania, Philadelphia. A plant for the dyeing of colors on cotton yarns for upholstery and other textile manufacturers is being operated at 2076 Margaretta St., Frankford, by Messrs. Lenox & Masland. Mr. Joseph Masland is the superintendent and reports business as fair.

Quebec, Drummondville. The Drummond Cotton & Bleaching Company has been incorporated recently with capital stock of $150,000. Hon. Senator Mitchell (Drummondville), James Wm. Woods (Ottawa), Geo. A. Gatehouse and Geo. Bothamley (Montreal), are among the incorporators. A new building will be erected for bleaching and finishing cottons at first, but it is expected that in time further developments will be made. Messrs. Gatehouse and Bothamley have been connected with the Dominion Cotton Mills Co. and the Montmorency Cotton Mills Co., respectively.

Enlargements and Improvements.

Maryland, Cumberland. A new dye house is to be erected for T. Footer & Son. The building will be four stories, brick and stone.

Massachusetts, Plymouth. The Plymouth Cordage Company will erect a new warehouse, 650 by 60 feet.

Massachusetts, Webster. The Stevens Linen Mill Corp. will remove the upper portion of the old Merino Woolen Mill, in erecting the large new storehouse in the Merino Village.

Massachusetts, Worcester. A new storehouse, 40 by 75 feet, is under construction for the Peter Wood Dyeing Company.

Pennsylvania, North Wales. A new mill, 100 by 40 feet, two stories and basement, is to be built for the Asbestos Fibre Spinning Company.

Rhode Island, Providence. Work is under way on erection of an addition to the Glenlyon Dye Works.

South Carolina, Clearwater. It is reported that the Clearwater Bleaching & Manufacturing Co. will double the capacity for bleaching and finishing bag goods.

FIRES.

Pennsylvania, Pittston. The Shepard Hosiery Company's plant was damaged by fire recently. The loss is mostly to the machinery.

*Rhode Island, Bellefont. The Whittle Dye Works, whose plant was recently destroyed by fire, have not yet decided about resuming business.

KNIT.

New Mills.

California, San Francisco. The Saxony Knit Goods Company has recently been put in operation by Messrs. Sultan & Sanburn, manufacturing fancy worsted sweaters. One of the members of this firm was recently in Philadelphia, buying machinery and supplies. They sell direct.

*New York, Amsterdam. Cornelius Jordan will start operations in his new knitting plant about Sept. 1st. Ladies' jersey ribbed underwear will be made. Will operate 14 knitting and 8 sewing machines, using steam power.

*New York, Greenwich. The Pleasant Vale Mills, which are to be removed to Scranton, Pa., have been partially shut down, preparatory to moving. A company has been formed with capital stock of $200,000 to operate the new mill at Scranton. It is thought that the plant will be running early in September.

*New York, St. Johnsville. The St. Johnsville Knitting Mill, a new concern, is now operating the plant. They have a capacity of 150 dozen per day at present.

*North Carolina, Monroe. The new building for the Crow Hosiery Mill Co. will be 180 by 40 feet, one story, brick.

Pennsylvania, Philadelphia. High-grade sweaters and ladies' blouses are being manufactured by the Keystone Knitting Mills, just started up at 218 Arch St. All the machinery for this plant has not yet been ordered, only enough being on hand to make up their samples, which are of fine quality and for which they claim they are receiving many orders. The goods will be sold direct.

Pennsylvania, Philadelphia. James Lenox, formerly employed by Wallace Wilson, manufacturer of knit goods in Frankford, announces that he is about to start in the knitting business in Frankford and is looking for quarters at Church and Spring Sts., having already placed his order for machinery, yarns, etc.

Pennsylvania, Philadelphia. The New American Knitting Mills, of which David Block & Co. are the proprietors, will have for its equipment 10 Lamb knitters of an improved pattern, 6 sewing machines and one 24-spindle winder, the machinery being run by both steam and hand. This plant, although not yet in operation, has received many orders, enough in fact to keep them running steadily for several months to come, most of the orders being for local delivery. Will manufacture men's and boys' sweaters, ladies' blouses and Norfolk jackets which will be sold direct. The plant will be enlarged from time to time as the business increases.

Pennsylvania, Philadelphia. Parties contemplating starting up in the hosiery business in Frankford have been looking for quarters in the Dale mill on Gillingham St. No information could be gained as to the name of the firm, but it is said that the plant will be in operation early in the coming fall. They will make women's fine hosiery and sell the goods direct.

*Pennsylvania, Pottstown. Arthur Booth and William S. Beltz, of this place, are interested in the

Endurance Knitting Mills Co., recently incorporated with a capital stock of $10,000.

*Pennsylvania, Schuylkill Haven. McWilliams Bros. expect to start their new mill early this month, manufacturing underwear. The mill building is 60 by 36 feet, two stories, with engine and boiler house annex. A 50 h. p. boiler and 40 h. p. engine has been installed.

*Pennsylvania, Scranton. Work is progressing on the erection of the new building for the Groat Knitting Co. The company expects to have the plant running not later than October first and will start with a force of about 400 people.

*Pennsylvania, Wyomissing. Work has been started on building new mill for H. D. Leinbach. It is expected that the plant will be ready to start operations in about two months, making rib hosiery, using yarns, 18s, 20s and 40s. Will install 16 knitting machines and use steam power. F. B. Berlin, New York, will sell the goods.

*South Carolina, Spartanburg. Work is nearing completion on the Crescent Manufacturing Company's new mill. The main building is 135 by 61 feet, two stories, with dyehouse 40 by 60 feet, one story, and engine and boiler house. The building will accommodate 200 knitting and 200 ribbing machines, but only 50 of each will be installed at first. They expect to start operations about September 1st, with about 100 employees, making misses' ribbed goods.

*Wisconsin, Manitowoc. E. C. Sixta is president and treasurer of the Wisconsin Knitting Company, which was recently reported incorporated with a capital stock of $100,000, and which has begun operations. E. H. Ludwig is superintendent of the plant. They now operate 24 knitting and 10 sewing machines on sweaters, cardigan jackets, golf blouses and other knit novelties. Concern operates a plant of six sets cards at Grafton, where woolen yarn is made. Will increase knitting plant to 60 knitting and 20 sewing machines. Plant is operated by steam and electricity. Sell goods direct.

Enlargements and Improvements.

Georgia, Marietta. The Marietta Knitting Co. has completed addition of about 1,800 square feet of floor space to put in additional machinery, increasing the output to 700 dozen pairs seamless half hose per day.

*Indiana, Elkhart. The Lakeside Knitting Co., previously reported to combine the plants at Michigan City and Elkhart, is erecting a brick store house, 80 by 100 feet, adjoining the new building.

Iowa, Des Moines. Plans have been prepared for a new brick and steel warehouse, 148 by 54 feet, 1 story, to be erected for the Des Moines Hosiery Company. It is thought that work will start this fall on construction of above.

Massachusetts, Lowell. W. A. Eastman, manufacturer of hosiery, has installed three additional knitting machines in the plant.

Michigan, Detroit. J. Friedman, proprietor of the Progressive Knitting Mills, has started a branch plant in which only negro help is employed. About 25 girls are now employed.

Minnesota, Minneapolis. The Northwestern Knitting Co. has started work on construction of a new warehouse, which will be 80 by 185 feet, 3 stories. The first floor front will be devoted to the general offices while the rest of the building will be used for the warehouse purposes.

New Jersey, Rosenhayn. The Empire Knitting Mills is the name of the new mill started in this town about eight months ago by A. Schwartz and D. L. Schiendelmann for the manufacture of all kinds of plain and fancy knit goods, such as wool and worsted golf vests, blouses and sweaters, on eight knitters. Mr. Schwartz is just now showing their samples for the coming season, which are very fine, and reports that orders are coming in in large lots. They are very busy and have a consignment of about 20 new German machines now on the way, which they will put in operation as soon as delivered. The goods are sold direct.

New York, Perry. The Perry Knitting Company's new electric plant has been completed.

*New York, Utica. The Richelieu Knitting Company, which recently increased the capital stock to $75,000, will not install any additional machinery.

North Carolina, Newton. The Newton Hosiery Mill has recently completed installation of full automatic knitting machines in the plant which has a capacity at present of 1,000 dozen daily.

North Carolina, Raleigh. The Martin Hosiery Mills have placed contract for installation of 30 additional machines in the plant.

Ontario, Galt. The Galt Knitting Co. has purchased the barracks and land owned by the Salvation Army and propose using same for extension to their mill.

Pennsylvania, Hamburg. W. Scott Fisher & Son have installed three new knitting machines in their plant, giving them a total of ten knitters and three sleevers now in operation.

Pennsylvania, Philadelphia. Brownhill & Kramer, formerly located at 1214 Crease St., have removed to the three story building at Memphis & Columbia Ave., which they recently purchased and improved with an addition 85 by 60 feet. The mechanical capacity of the plant has been increased to 60 ribbers and 100 Standard knitters, turning out about 800 dozens a day. They manufacture ladies' and men's fine cotton and lisle hosiery and boys' ribbed goods, for which they are receiving many orders. Mr. Brownhill is the superintendent. They do their own dyeing, the goods being sold through New York.

Pennsylvania, Philadelphia. The Allegheny Worsted Mills, 1931 Hope St., which recently removed from Trenton Ave. and Norris Sts., to this address, are about to put in 10 new National Ribbers. The present equipment of the plant consists of 52 knitters, 2 sewing machines and 5 loopers, which they run on cotton and lisle flat and ribbed ladies', misses' and infants' hose which they finish and sell direct and through New York. They report business as picking up. Mr. William Hoffman is the superintendent.

Pennsylvania, Port Carbon. A new building, 123 by 54 feet, four stories, is to be erected for

M. Phillips & Son. Building is to be equipped with all the latest appliances.

Pennsylvania, Reading. A new mill is to be erected for the Gem Knitting Mills Company. Building will be three stories, brick, and basement.

*Pennsylvania, Shamokin. Work has been started on new addition to Wm. F. Taubel's hosiery mill.

*Tennessee, Knoxville. The Biddle Manufacturing Company is rebuilding the bleaching plant and installing additional knitting machines.

Mills Starting Up.

New York, Troy. The Wayside Knitting Mill has started up again after three months' shut down.

Pennsylvania, Georgetown. C. M. Romberger's hosiery mill, which has been closed for some time, has resumed operations.

Mills Shutting Down.

Pennsylvania, Philadelphia. The firm of Louis Weber & Co., 404-14 Memphis St., of which Louis Weber was the sole owner, manufacturers of fine seamless cotton hosiery on 150 knitting machines, is no longer in existence. Mr. Weber having sold out the machinery and, it is now reported, having taken an interest in the firm of Sassman & Donohue, manufacturers of carpets, at 1819 North 5th St.

Facts and Gossip.

Connecticut, Putnam. The Business Men's Association is considering a proposition made by the Home Knitting Mills of Boston relative to their removing the plant to this place. G. A. Hammond, W. S. Johnson and Richard Gorman have been appointed to look into the matter and if possible complete arrangements.

Massachusetts, Lowell. The Waukenhose Knitting Company has been organized with capital stock of $60,000. Solomon W. Bates is president and Levi Turner, treasurer.

New York, Brooklyn. The Peerless Knitting Mills have been incorporated with capital stock of $5,000. D. Hirshkind (formerly sole proprietor), Geo. L. Combes and Samuel Packard are the incorporators.

New York, Port Henry. It is reported that a project for locating a knitting mill here is under consideration.

*New York, West Sand Lake. The McLaren Knitting Co. has been incorporated with a capital stock of $10,000 to succeed J. and R. McLaren. John R. McLaren is president of the company and John Trainor, treasurer. This plant is now in operation on men's and boys' underwear and overshirts with equipment of 5 sets of cards, 24 knitting and 34 sewing machines; Bacon & Co., New York, sell the goods.

Pennsylvania, Reading. John Gaenzle and Charles E. Leippe, operating the Reading Knitting Mill, under partnership, have dissolved by mutual consent. Mr. Charles T. Davies has purchased Mr. Gaenzle's interest. The business will hereafter be conducted under name of the Reading Knitting Mills, Leippe & Davies, proprietors.

Personals.

Cotton.

Raymond D. Borden, formerly bookkeeper at the Davis Mills, has been elected treasurer of the Watuppa Mills, Taunton, Mass. William B. Edgar, who has been acting as treasurer temporarily, will assume duties of president.

W. B. Bruton has accepted position of overseer of weaving in the Manetta Mill, No. 2, at Lando, S. C. He was formerly at Asheville and Charlotte, N. C.

John Howard, overseer of spinning at Seneca, S. C., has resigned his position to accept a similar one with the H. C. Townsend Mills, of Anderson, S. C.

Robert H. Craig succeeds F. L. Page as superintendent of the Harriet Cotton Mills, Henderson, N. C.

Lewis Dexter, Jr., manager of the St. Croix Cotton Mill, Milltown, N. B., for many years, has resigned. He is succeeded by J. W. Graham, superintendent of the plant.

Capt. A. M. Fairley has resigned his position of treasurer and superintendent of the Tarboro Cotton Mill, N. C., and accepted position of general superintendent at the Washington Mills, Fries, Va.

R. B. Jennings tendered his resignation as president of the Capital City Cotton Mills, Columbia, S. C. It is thought that Lewis W. Parker will be president when plans for reorganization are perfected.

B. F. Guy, formerly superintendent of the Eufaula (Ala.) Mills, is now in similar position with the Winona Mills, Winona, Miss.

Ellis Laycock has accepted a position as overseer in a Lowell mill. He was formerly with the Worcester Textile Co., Franklin, Mass.

J. H. Cunningham, formerly with the McComb City Cotton Mills, has accepted a position as overseer of carding with the Lincoln Cotton Mills, Evansville, Ind.

Lewis Dexter, manager of the St. Croix Cotton Mills for many years, has severed his connections with that concern. His position has been filled by Whidden Graham.

Frank C. Haskell has been appointed superintendent of the New Bedford Spinning Mill, to succeed Thomas F. Glennon.

B. L. Ledwell is to be overseer of carding and spinning in the new plant to be started up shortly

at Marshall, N. C. He was formerly located at Wadesboro.

C. P. Lincoln, who has been superintendent of the Enfield Mills for the past nine years, has resigned. Henry Anthony succeeds him.

Samuel Fortenby has taken a position as overseer of dyeing for the Manetta Mills, Lando. He was formerly at the Springstein Mill, Chester, S. C.

Wm. McIntyre boss finisher and later assistant superintendent at the J. & P. Coats mill, died recently.

W. M. Chandler, who has been with the Piedmont Mfg. Co., Piedmont, S. C., is now second hand of carding at the Gluck Mills, Anderson, S. C.

George D. Wooley is now boss weaver at the Slater Cotton Co., Pawtucket, R. I.

F. L. Page has resigned as superintendent of the Harriet Cotton Mills. He has gone to Statesville, N. C., to accept superintendency of the Statesville Cotton Mills.

J. B. Smith has resigned as overseer of spinning at the Revolution Mills, Greensboro, and accepted a similar one at the Lily Mills, Shelby, N. C.

E. C. Gwaltney has accepted a position with the Lancaster Cotton Mills, Lancaster, S. C. He was formerly overseer of carding with the Skenandoa Cotton Co., Utica, N. Y.

J. J. Farris has resigned his position as superintendent with the Millen Mills, Millen, Ga. He has taken a position with the Lily Mill & Power Co., Shelby, N. C.

William Kushaw of Philadelphia, has accepted position of overseer of finishing at the Hope Mills Manufacturing Co., Fayetteville, N. C.

E. C. Watkins has resigned as superintendent of the Columbia Manufacturing Company's mill, Ramseur, N. C.

C. Smith has been succeeded as superintendent at the City Mill by John Cantlin.

Woolen.

Joseph Beale has accepted a position with the Eclipse Woolen Mills, Louisville, Ky., as boss weaver.

George A. Bentley, boss carder at the Plainville (Conn.) mill for many years, is now employed at the Oakland Woolen Company, Oakland, Me.

W. T. Cross is assistant dyer at the Assabet mills, Maynard, Mass. He was formerly second hand of dyeing at the Washington Mills, Lawrence, Mass.

William H. Butler, who has been superintendent of the Manchester (N. H.) Mills, has taken a similar position with the Atlantic Mills, Providence, R. I.

Michael Bowen has resigned his position as overseer of weaving for Henry B. Farrell, Philadelphia.

Thomas C. Scott, formerly carder at the Paton Manufacturing Co.,s mill, Sherbrooke, Que., is now carder for the Concord Manufacturing Co., Penacook, N. H.

E. H. Harrison has been appointed overseer of the Racine Woolen Mills, Racine, Wis. He was formerly at Herkimer, N. Y.

F. W. Howarth has severed his connection with Stevens & Co. as overseer in their wool department.

William R. Cameron has resigned his position as overseer of spinning in the Atlantic Mills and accepted position at the Valley Mills of the American Woolen Company, Providence, R. I.

William H. Crompton has severed his connection as boss finisher with the Atlantic Mills.

Howard Dudley has resigned his position as boss dyer for the Mohawk Mfg. Co., Oswego, N. Y.

Samuel C. Wilson is now overseer of carding at the Broadhead Worsted Mills, Jamestown, N. Y.

James Grindrod is now superintendent and designer for the Evansville Woolen Mill Co., Evansville, Ind.

Thomas Kilduff has accepted superintendency of the Michigan Central Woolen Co.'s plant, Centreville, Mich. He held a similar position previously with the Union Mills at Hudson, N. Y.

George Leach, of the Nasonville Woolen Mill, was drowned while on his vacation near Digby, N. S. He was not married.

August Kuhnert has resigned his position as dyer at the Riverview Worsted Mills, Waterville, Me. He has purchased the Kennebec Mat & Duster Co.'s plant at this place and will make improvements to same for enlarging the business.

B. V. Searle has resigned as overseer of carding for Talcott Bros., Talcotville, Conn., and accepted a position in the Bay State Mills, Lowell, Mass.

John S. Sherwood is carder at the Plainville Mill, Bristol, Conn.

Peter J. Gerguson succeeds James Murphy (resigned) in charge of the carding department of the Nye & Wait Carpet Co.

Joseph Wood has taken charge of dyeing department of plant in Los Angeles, Cal. He was formerly in charge of the dye department of the Hellliwell Mills.

Thomas H. Lyon succeeds William H. Brompton (resigned), as boss finisher at the Atlantic Mills, Providence, R. I.

L. H. Love, recently engaged as overseer of the Fern Rock Woolen Mills, Philadelphia, has resigned to accept charge of weaving at the Moosup (Conn.) Mills of the American Woolen Company. R. Charwick of Fredericksburg, Va., succeeds Mr. Love.

G. W. Overend has resigned as superintendent of the Riverview Worsted Mills, Waterville, Me.

S. B. Rhodes has resigned as manager of the Parkmount Mills, Lenni, Pa. He has been succeeded by Mr. Robinson.

William J. Murray, superintendent at the Globe Mills, Utica, N. Y., has accepted a position with the Peacedale Mfg. Co., Peacedale, R. I.

Daniel Prendergast, Jr., resigned as superintendent of the Consolidated Wool Felt Mills, Amsterdam, N. Y. He has been succeeded by John Stansfield.

R. G. Raymond, formerly superintendent of the yarn department of the Sawyer Mill, Dover, N. H., is now superintendent at the Seneca Falls Woolen Mills, Seneca Falls, N. Y.

William Stuart has resumed his old position as finisher at the Squam Lake Woolen Mills, Ashland, N. H.

Timothy Smith, overseer of dressing at the Weybosset Mills, Providence, R. I., has resigned.

Gotleib Pultz has been succeeded by Samuel Bowker, of Chelsea, Mass., as boss dyer for the Racine Woolen Mills.

Mr. K. Taubert is designer at the Atlantic Mills, Providence, R. I.

Arthur Threappleton has taken charge of the spinning and carding department at the Norfolk (Va.) Yarn Mills.

D. White, formerly at Guilford, Me., succeeds John Waugh, Jr., as boss carder at the American Woolen Co.'s Skowhegan mill.

James Tobin has accepted position of dyer at the Germania Mills, Holyoke, Mass. He succeeds Mr. Fredericks.

Charles Legg has resigned as superintendent of the Huguenot Mill, North Oxford, Mass.

J. J. Supple succeeds James Tobin as dyer at Beebe Webber Co.'s plant, Holyoke, Mass.

W. W. Wetzel has accepted position with Dornan Bros. Carpet Mills (Philadelphia), as overseer of spinning. He was formerly with Southwark Mills Co.

G. Whitaker is now finisher at the Beckman Co.'s plant, Cleveland, O. He was formerly employed in Buena Vista, Va.

Miscellaneous.

John McAdam succeeds Peter Hunter as manager of the Eddystone Manufacturing Company's plant, Eddystone, Pa. Mr. MacAdam has been superintendent of the print works department.

Robert A. S. Reoch has been appointed superintendent of the Cocheco Print Works, Dover, N. H. He was formerly at Phenix, R. I.

Patrick H. Hannafin, overseer of the finishing department in the Cocheco Print Works, has resigned to accept similar position at Apponaug, R. I.

Albert E. Jones, who has been overseer of dyeing at the Hecla Mill, Uxbridge, Mass., for many years, has accepted position with the Koted Silk Underwear Co., Millbury, Mass.

Frank P. Pearson, general manager of the Arnold Print Works for the last twelve years, has sent in his resignation, to take effect Jan. 1st. He has as yet made no plans for the future.

Alfred Osler has resigned his position in the weaving department of the Talbot Mills, to accept a position on the Fitchburg Division of the Boston & Maine Railroad.

Edward S. Wilkinson has recently been elected assistant treasurer of the Arnold Print Works.

Deaths.

Charles S. Bliven, part owner of the Packerville (Conn.) Manufacturing Co.'s plant, died at his home in Willimantic recently, aged 76 years. A widow and three children survive him.

John F. Morris, of A. V. Morris & Sons, Amsterdam, N. Y., died at his home, July 30th, aged 65 years.

Erastus Boyden, formerly superintendent of the Prescott Mills of the Massachusetts Company, died at the home of his son-in-law (Dr. G. H. Pillsbury) aged eighty-three. Mr. Boyden was well known in the cotton manufacturing circles of 40 years ago.

Henry Osborn, secretary of theDunham Hosiery Co. (Naugatuck) was murdered at his home, Hartford, Aug. 5th, by a colored servant whom he had formerly employed. Mr. Osborn leaves a wife, daughter, son and mother. Mr. Osborn was 58 years of age.

P. M. Harder, of the High Rock Knit Goods Company, died at Philmont, N. Y., aged eighty-six. Mr. Harder leaves a wife, daughter and son.

Gilbert P. Cuttle died at his home in Fall River, Mass., August 17th. Mr. Cuttle was born in Leeds, England, and came to this country when 14 years of age. He was employed in some of the largest plants in Fall River, last position being with the Border City Mills, as superintendent, which position he resigned two years ago owing to ill health. He leaves a widow and five children.

Frederick W. Whipple died at Burrillville, R. I., last week, aged 62 years. Mr. Whipple was formerly interested in woolen mills at Burrillville, R. I., and Cavendish, Vt., both of which were destroyed by fire. He retired from business in 1887 owing to illness.

Seth L. Hurd died at his home, Rochester, N. H., after a long illness. Twelve years ago Mr. Hurd obtained a patent for a stop motion for looms, which was first used by the Norway Plains Woolen Mills.

Robert Burns Blodgett, until recently connected with the Cassella Color Co., died last week Tuesday, at the home of Mr. and Mrs. Lemuel R. Howe, Hull, Mass., with whom he was spending the summer season, and long made his residence in town. Mr. Blodgett was born January 1st, 1853. He spent his boyhood days in Boston schools and started his business career with Mr. Howe's company, afterwards becoming agent for Lutz & Movius, a German color house, subsequently interesting himself with Wm. J. Matheson & Co., Ltd., which concern is now known as the Cassella Color Co. Mr. Blodgett, who was a bachelor, is survived by two brothers. He was a member of the Exchange, Algonquin, Country and Eastern Yacht Clubs.

Joseph Whyatt died suddenly in the Elizabeth Poole Mills, while at work. He was 48 years of age and leaves a widow. Mr. Whyatt had been em-

ployed for many years at these mills, as overseer of the slashing and warping rooms.

William Moore, treasurer of the Granite Knitting Mills and president of the Erie Knitting Mill, died at his home in Albany, Aug. 15. Mr. Moore was born in Ireland in 1827. He was also president of the Manufacturers' Bank.

Dr. J. H. McAden died quite suddenly at his home in Charlotte, N. C. Mr. McAden was president of the McAden Mills.

Henry G. McCarter, superintendent of the John Farnum & Co.'s mill, died August 1st, at the University of Pennsylvania Hospital, from the effects of an operation performed.

William R. Rison, secretary, treasurer and manager of the Dallas Manufacturing Company, Huntsville, Ala., died last week, after an illness of several months.

John Robinson, who has been superintendent of J. & J. Dobson's blanket mill, Falls of Schuylkill, up to 1902, died last week. He was born in Fallsworth, Lancashire, England, in 1842.

Harding Roscoe Sayles, interested in the manufacture of woolen goods in Pascoag, with Fiske, Sayles & Co., until retiring a few years ago, died Aug. 7th at the home of his daughter, Mrs. H. S. Tanner, in Edgewood. Mr. Sayles was born in Burrillville, May 20th, 1835. A wife, daughter and two brothers survive him.

Herman D. Clark, operating a silk plant here, died August 1st. Mr. Clark was born March 1st, 1856, and became associated in the silk business with his father. He leaves a wife.

Carl A. W. Piell, secretary of the Botany Worsted Mills, Passaic, N. J., died of cancer, at the German Hospital, New York, recently. Mr. Pfell was 51 years of age. A wife and two sons survive him.

William B. Toland, of Toland & Hance, wool dealers, 124 South Front St., Philadelphia, died recently, at his summer home, Pitman Grove, after an illness of three weeks. Mr. Toland, who had been interested in the woolen business since 1885 and with Toland & Hance since 1899, was born 49 years ago. A wife and two children survive him.

Henry C. Weston, of Weston, Farnsworth & Thayer, died July 29th at his summer residence, Beverly Farms, Mass., at the age of 70 years. Mr. Weston was prominent among the directors of the State National Bank and also of the Old Colony Trust Co., where he was one of its executive committee. He is survived by a wife and married daughter.

Richard Thornley, dealer in wools, shoddies and flocks, providence, R. I., died at his home August 6th.

Charles H. Walker, head designer of the Eclipse Mills, North Adams, Mass., died Aug. 8th at his former home, Lovell, Me., where he was spending his vacation. He was thirty-three years of age and unmarried.

New York, Rochester. The Flower City Dye Works have been purchased by Andrew Bryson, of North Adams.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Calculation for Woven Fabrics (Die Calculation der Webwaren), by J. Schams, Director of the Royal Weaving School in Muenchberg, Germany; J. Riedel, Muenchberg. 2d Edition price $1.00.

It is but a short time since this work first appeared and the publication of the second edition so soon speaks well for its reception in Europe. The new edition has been enlarged by the addition of a number of sections accompanied by woven samples for each of which the quantity of material required has been calculated and the cost estimated. While the book is in German and is particularly suited for German practice, yet the English student of textile calculations will find much valuable information. It contains the usual mixture of weights and measures which are an essential feature of all Continental books on textile manufacturing.

Oriental Rugs (Vorderasiatische Knupfteppiche); Wilhelm Bode; Hermann Seemann, Leipzig. Price $1.75.

This work is written by one of the best known experts on Oriental rugs and he presents to the reader an excellent series of illustrations with a well written description giving a general view of the art. The collection illustrated in the work includes some of the best samples of Oriental rugs to be found in Europe and there are very few men besides Dr. Bode who would be able to obtain the illustrations of such a truly representative line of the best class of rugs.

Map of Peru; Don Eugenio Larrabure y Unanue, Peru.

This is a pocket map of Peru which has been published to familiarize merchants in foreign countries with the Peruvian Republic and the location of the various trading points on the coast and in the interior.

Map Making (Construction et Dessin des Cartes Geographiques); A. M. Perrot; L. Mulo, Paris.

This is a manual designed for the map-maker and treats of the drafting of maps and the various forms of mounting them.

Chemical and Pharmaceutical Industries (Les Industries Chimiques et Pharmaceutiques); Albin Haller; Gauthier-Villars, Paris, France. Price $5.00.

This work is based on the chemical and pharmaceutical exhibits at the Paris exposition of 1900. It will be found of great value to chemists because of the vast amount of information regarding the latest chemical products to be placed on the market and which were shown at the Paris exposition. It is impossible for a visitor to an exposition such as that at Paris, to form any adequate idea of a chemical exhibit and therefore a work of this kind is absolutely necessary in order to supplement the exhibit itself and give a clear idea of what really was at the exposition.

Industrial Electricity; by M. C. Lebois; Charles Delagrave, 15 rue Soufflot, Paris. Price, $1.00.

During the past few years the application of electricity to industrial purposes has been so extended that today it is difficult to find a mill in which this force is not used. For this reason a knowledge of electricity has become indispensable to all. It is by no means as easy to acquire a general knowledge of this force as it is to become familiar with the use of steam and water for power. An intelligent mechanic can build a steam engine after taking one apart and putting it together again. This is not the case with a dynamo, for the construction of which some abstract knowledge of electric currents is necessary. To impart an elementary knowledge of electricity is the object of this work. It is freely illustrated and each of the short chapters or sections is followed by practical examples illustrating the subject matter already treated. The text is in French.

The Beginner; by William Wright; Rosenbaum and Hart, W 66 Wilhelmstrasse, 47, Berlin; price 75 cents.

A hand book for learning the German language by self instruction. It is based on the popular and successful method, called natural, and which has given such satisfactory results in imparting a working knowledge of foreign languages.

European Commercial Correspondence; by Dr. A. Wolff, Dr. H. Robolsky and Rodolfo Sepulveda; Gebhardt & Willisch, Leipzig, Germany; 794 pages; price $3.25.

The increase of communication between the different parts of the world and the rivalry among the leading manufacturing nations in the struggle for foreign trade has during recent years greatly increased the importance of a knowledge of the English, German, French, Italian, Spanish and Portuguese languages. It is a well known fact that a person may have an excellent general knowledge of a language and yet be unable to use it in special departments of trade or industry on account of the large number of technical or trade terms used. The object of this work is to give the commercial man the sentences, business forms, etc., in the six languages above mentioned. The first section is a commercial lexicon, classified according to the different branches of business. This is followed by chapters giving commercial phrases similarly classified; forms for circulars, bills, etc.; business letters; forms for book-keeping; concluding with a treatise on commercial law. All of the reading matter is duplicated in each language. The work cannot fail to be of great value to many in this country who are endeavoring to extend our trade in foreign countries.

Tables for Calculating the Cost of Goods (Warenpreis-Berechnungs-oder Kalkulations-Tabellen); Max Tauscher; Gustav Weigel, Leipzig, Germany. Price 75 cents.

This book contains a list of tables which give the selling prices required to show various percentages of profit on a given cost price. Being based on percentage it is as well suited for manufacturers in America as in Germany.

Examination of Fibres and Fabrics (Untersuchungen von Gespinsten und Geweben); Samuel Marschik; Karl Gerolds Sohn, Wien, Austria. Price 75 cents.

The textile trade needs a practical treatise on the examination of fibres and fabrics. Unfortunately the author of this work has become so absorbed in theory that he has neglected the practical aspects of the subject. There is no question, however, but that to the student his work will be valuable, as it is a careful, scientific analysis of the subject. In the first part the following subjects are referred to: Relation between yarn number, diameter and strength; elasticity and tenacity; warp tension; relation between tension and speed of a spooler, and between count and set of filling; calculation of weight from set and yarn count; calculation of strength of cloth from the strength of the yarn. The second part is entitled "Practical Tests," but an examination shows that it is not what is popularly considered practical in mill work. A mass of algebraical formulas are used for determining the diameter, specific weight and strength of yarn. An appendix treats of determining the size, strength and elasticity of yarn and the strength and elasticity of fabrics. Important as the book unquestionably is from a theoretical standpoint, it is not likely to be of much help to the practical textile worker who needs less algebra and geometry and more plain, every day arithmetic.

Protection in England (La politique protectionniste en Angleterre); Georges Blondel; Victor Lecoffre, Paris, France. Price 75 cents.

The movement in England toward protection has alarmed the Continental nations, as it carries a threat to many of their industries whose products find a market in the British Empire. The title page of the book refers to the Chamberlain agitation as a new danger for France, and the author advances strong arguments and an imposing array of statistics to support his contentions. He traces the economic evolution of the English people to the present time, outlines the Chamberlain policy and states the objections to it. In a separate chapter he points out the danger to other countries, and gives reasons why America has supplanted England in many industries. He compares the proportions of English food supplies received from English colonies and from foreign countries, also makes a comparison of the commercial policies of England, Germany and France. A very interesting chapter is that dealing with projects for a Continental union to offset the exclusive policy of England and America. Protection has become the settled policy of nearly every country of Europe, England being the only important exception, and this work is interesting as giving a comprehensive view of the question, showing its bearings from an international standpoint.

Manual for the Chauffeur (Manuel du Chauffeur); by A. Jaunez; J. Hetzel & Cie, Paris.

The rapid increase in the use of the automobile and the large number of persons desiring to acquire a knowledge regarding the management of these vehicles, led to the publication of this book, which is already in its sixth edition. Numerous illustrations of the working parts of the automobile add materially to a clear understanding of the subject.

Calculator for Cotton Weavers (Das Calculations-Buch des Baumwollwebers); Josef Ittenson; Gustav Weigel, Leipzig. Price 75 cents.

This is a small handbook containing fourteen tables of constant numbers to facilitate calculations for different sizes of cotton yarn. Each table is based upon a different length of the cotton skein, corresponding to a certain allowance made for take-up, sizing, and other factors calculated to affect the actual length of the yarn. The basis for all the tables is the English cotton skein as the English system is the only one in use in Germany for cotton yarn. In addition to these tables a number of examples are given illustrating the problems involving the use of the various European local units which complicate textile calculations for Continental manufacturers. In each of these examples the local and metric units are reduced to the English standard.

Lightning Calculator for the Price of Goods (Waaren-Preis-Schnellberechner); Fr. P. Zeuner; Gustav Weigel, Leipzig, Germany. Price 75 cents.

The greater part of this pamphlet is occupied by tables which give prices corresponding to certain percentages of increase over a given price. It enables the merchant to determine at a glance what selling price to place on goods of a given cost in order to obtain a required percentage of profit. These tables are followed by others showing the comparative value of the currency of different countries.

Chrome Mordants (Die Chrombeizen); Wilh. Hallerbach; A. Hartleben, Wein, Austria. Price $1.

This is a handbook of chrome mordants, the latest addition to Hartleben's well-known technical library. It is a work of 106 pages, beginning with an introduction in which an account of the chrome industry is given. The next chapter is devoted to chrome and mordants in general. Following this the author classifies and describes chrome compounds. The concluding section of the work is devoted to special chrome compounds. The book is an important addition to the literature of the chemistry of dyeing. The text is in German.

Illustrated Handbook of Cotton and Woolen Spinning, Including Shoddy and Batting (Illustriertes Handbuch ueber die gesamte Baumwoll-Spinnerei und die Streichgarn-Spinnerei der Wolle, nebst der Kunstwoll und Wattenfabrikation); Josef Ruemmler, Furth im Walde, Bavaria. Price $5.00.

The author of this book is a German custom house official who has evidently been in charge of the imports of textile machinery, and has considered that a knowledge of textile machinery and processes thus acquired is worthy of being published in book form. The work is classified according to the different processes of cotton, woolen and shoddy spinning and batting manufacture, and is freely illustrated with views of English, German, Swiss and Belgian textile machinery. The makers' name is given in every case with a brief description of each process. The greater part of the work consists of descriptions of the machinery. It contains a large amount of information presented in a novel form.

New England Lakes.

The lake resorts of New England—the favorite haunts of the anglers and vacationists in search of an ideal inland resort—are now the rendezvous for hundreds of tired mortals from the busy city. The canoeists are gliding over Sunapee, and the many cottages and hotels present a joyous scene. On Winnipesaukee, the Queen of New England lakes, the stately steamer, the "Mt. Washington," makes her daily trip of sixty miles, touching at the numerous ports on the lake such as Wolfboro, Weirs, Centre Harbor and Alton Bay, where summer gaiety and pleasure reign supreme. Memphremagog in Northern Vermont, on whose beautiful shores tourists assemble from all parts of the country, is a delightful scenic resort; its admirers have called it "the Switzerland of America." The "Lady of the Lake" furnishes the means of transportation over Memphremagog. In Maine are the famous fishing grounds equally desirable as summer resorts, Sebago, Moosehead and the Rangeleys.

These resorts are all described in the beautiful illustrated booklet, "Lakes and Streams," also in the booklets "Lake Sunapee," "Lake Memphremagog and About There." These booklets will be mailed to any address upon receipt of two cents for each book, and the charming portfolio of half tones of New England lakes will be mailed by the General Passenger Department, Boston & Maine Railroad, Boston, upon receipt of six cents.

If you are planning your vacation, send for these books and also secure the Summer Resort Book free. This book contains the hotels, rates and routes and the various resorts reached by the Boston & Maine Railroad and connections.

A Large Electric Power Plant.

Persons visiting the big engine in Machinery Hall at the World's Fair, where the enormous Allis-Chalmers-Bullock 5,000 horse power steam-electric unit is the largest ever shown at an exposition, will have an opportunity of seeing beside it the smallest operating steam engines in the Fair. These little fellows which are made with an accuracy and finish like clock-work, stand in a glass case just across the aisle from the big engine. There are two of them now operating, each working a direct connected pump and throwing their tiny streams into a copper tank which stands between them.

A Business Opportunity.

Attention is called to the advertisement in this issue signed "Opportunity." It is inserted by a Southern manufacturer who has a small, well equipped cotton mill which he desires to enlarge. For this purpose he wants to make a business connection with some one who will furnish the additional capital required. The mill is well located and we believe that it offers an excellent opportunity for an enterprising man who desires to engage in the cotton business in the Southern states where conditions are so favorable for a low cost of production.

The "Universal."

It is most properly called the "Universal," because of its adaptability to winding everything, from the most delicate and filmy silk fibre to a rope; it matters not, the principal is the same, however applied.

It is also known among the initiated as the "Leeson wind," J. R. Leeson being at the head of the Universal Winding Co., of Boston, represented in Paterson by Harry C. Nightingale, at whose office, 205-207 Paterson Street, one of the Universal winding machines, No. 10, is in operation and may be inspected.

When we speak of the system as adapted to silk winding we have reference to the filling, or charging, the quills for the shuttle in weaving. Only there is no quill, with heads on, for the winding is done on a headless tube, and nearly three times the quantity of fibre is put on each, thus obviating more frequent stoppages—with consequent loss of time, which is money—to change from an empty to a full quill. The long, unbroken run means much in a mill filled with machinery.

The "Universal" embodies the economical idea to absolute perfection. There is no waste, every thread unwinding to the last inch without possibility of tangle or snarl so common to the old method. This is accomplished through the peculiar manner in which the winding is done, the threads being placed on the tubes transversely from end to end, criss-cross fashion, as it were—every under thread being bound so that it is impossible for it to come off until reached in the regular process of weaving.

The best testimonial to the value of the Universal, or Leeson, wind is that, whereas cotton yarns and threads, banding, twines, etc., were formerly put up in the old way, or in balls, leading to vexatious tangle and loss, all these are now put up on principle.

Partnership Notice.

The trade has received the following notice:

August 1st, 1904.

Notice is hereby given that the co-partnership heretofore known as Globe Machine Works, engaged in the manufacture of textile machinery, etc., has been dissolved by the withdrawal of the undersigned, who has no further interest in said co-partnership. All debts owing by said firm will be paid by Charles Denn, the surviving partner, to whom should be paid all claims owing to said firm.

John Cocker.

4410 Waln St., Frankford, Phila., Pa.

An Attractive Exhibit.

One of the exhibits in the textile line at the Louisiana Purchase Exposition at St. Louis that is attracting considerable interest among the textile trade is that of J. L. Stifel & Sons, of Wheeling, W. Va. This concern manufactures a fine line of indigo prints and drills, and their product shown there is receiving the attention that it deserves.

Business Literature.

Labor Saving Looms; The Draper Co., Hopedale, Mass.

This is a bound volume of 240 pages describing recent improvements in plain looms, with special reference to the Northrop looms, which are manufactured by the Draper Co., also a large amount of useful information which should be within reach of every one interested in weaving textile fabrics.

Jeffrey Grab Buckets; Jeffrey Mfg. Co., Columbus, Ohio.

A profusely illustrated booklet covering a list of their different grab buckets.

The Book of the Four Powers; Allis-Chalmers Co., Chicago, Ill.

Appliances for the control of the four world powers, steam, water, gas and electricity, are described and illustrated in this pamphlet. Among the power plants included in the description are those at the St. Louis Exposition and Niagara Falls. Other installations for different industries throughout the world are also described. While intended primarily to call the attention of the trade to the Allis-Chalmers Co., the book illustrates the wonderful development in the generation and transmission of power.

Rhode Island School of Design Year Book, 1904.

A catalogue of the above named institution which includes a recently organized textile department which is in a promising condition.

The Kennebec Mat & Duster Co., of Waterville, Me., has been purchased by A. Kuhnert, who has installed a number of improvements which will enable him to turn out a greater product than heretofore. His line includes wool carriage mats and dusters, and with Mr. Kuhnert's ability and reputation we predict a successful future for this company.

The American Sugar Refining Co., New Orleans, La., have just placed an order for a 16-inch Pittsburgh vacuum exhaust head with the Pittsburgh Gage & Supply Co., Pittsburgh, Pa. This is the fourth repeat order.

MILL ACCOUNTS.

"His mill is makng money; he knows how much his goods cost."

This was a remark recently made of a prominent New England manufacturer whose mill is running steadily with a balance on the right side of the books, even at the present time when conditions are temporarily so unfavorable for the profitable production of textile goods. It stated one essential of success in all kinds of manufacturing. The determi-

nation of the cost of manufactured goods is a difficult problem in any branch of industry even where the processes are few and simple. It becomes one of great intricacy and difficulty when the processes are so numerous and complicated as in textile manufacturing. The increase in the size of the mills and the diversified products have forced manufacturers to adopt scientific methods of cost keeping. Under such conditions it is natural that experts should be required to design systems of mill accounts and verify them from time to time.

Among such experts who have earned an enviable reputation is the firm of Garry, Brown & Co., certified accountants, 35 Liberty St., New York. They are prepared to examine and verify accounts for the purpose of exposing fraud, correcting errors of principle in the treatment of accounts, detecting extravagant purchases, verifying costs and balance sheets. Manufacturers will find their services especially valuable in devising new and revising old systems of accounts.

A short time ago we called attention to the heavy loss sustained by a German manufacturer from the dishonesty of a treasurer whose crookedness had been covered by padding the inventories for a series of years. This instance illustrates one of many that are possible when mill accounts are not verified regularly by independent auditors.

Substitutes for Linen.

The Government analyst for Victoria, Australia, has made some interesting tests to determine the composition of goods sold as "all linen" on the Australian market. The goods comprised collars, handkerchiefs, and serviettes. The nature of the materials was ascertained by examination of the fibres constituting the threads of the warp and weft, following the detailed particulars serving for the identification of various plant-fibres used in the manufacture of textiles.

The results of the examinations are summarized as follows:—1. Man's collar, cotton. 2. Man's collar, cotton. 3. Man's collar, cotton. 4. Man's collar, cotton. 5. Man's collar, cotton. 6. Handkerchief, flax. 7. Handkerchief, cotton. 8. Handkerchief, flax. 9. Handkerchief, cotton. 10. Serviette, cotton and flax (union). 11. Serviette, flax. 12. Serviette, cotton and flax (union).

The five collars purchased by the inspectors were of the usual four-fold type. The back, front, and interlining in each instance consisted entirely of cotton. Two out of four handkerchiefs were made of flax; the other two contained cotton only. One of the three serviettes was made of flax; the remaining two were woven of a mixture of flax and cotton (so-called "union" goods). Bearing in mind that the inspectors asked specifically for linen when purchasing, it becomes of importance to ascertain the meaning attached to the word linen; and Mr. Wilkinson gives an interesting history of linen, showing that it has always been clearly understood to mean a fine and durable fabric made from flax. His historical notes are sufficient to indicate that the meaning of the word linen, as used in the English language, has been extremely clear for many centuries. There can indeed be no doubts as to its nature or of the substance from which it is believed by the public to be made, and from which all fabrics described as "linen" ought solely to be made.

Linen, Mr. Wilkinson continues, has always enjoyed a household reputation for durability, wear, and appearance, which is due to the nature of the flax fibre. Of late years, however, there has been a marked tendency to substitute part of the flax in the linen with cotton (so-called "union" goods). The origin of this practice is hardly to be sought in any alleged superiority on the durability or appearance of cotton, but, rather, in its lower price.

Manufacturers, however, have not rested content with the partial substitution of the more expensive flax; for goods woven to resemble linen in all its grades of fineness are now made wholly of cotton. So cleverly is this substituted and imitated product woven that in the case of bleached and dressed cloth it requires a trained eye to distinguish between an all flax, union, and cotton substitute. Persons demanding linen and linen goods buy, in the great majority of cases, in good faith; and it is not practicable for the housewife in her shopping to carry from shop to shop a powerful microscope and chemical reagents in order to test the quality or genuineness of the tablecloths, serviettes, handkerchiefs, or other articles for household use offered for sale as linen. Purchasers are entirely at the mercy of the vendors, and it is recognized that no two tradesmen take exactly the same view of "profits."

Mr. Wilkinson would advise that all linen and articles made of linen should be so stamped or marked as to prevent any possibility of the purchaser being deceived by unscrupulous traders. Substitution of flax, partly or wholly, by any cheaper fibre in goods resembling linen should be declared in an unmistakable manner by stamping or marking each article or each running yard with the name of the substitute or extent to which it is present. With regard to the present instances of the sale of cotton goods as linen, Mr. Wilkinson holds that it appears desirable, with the object of protecting the public as well as of honest merchants that prosecution should be instituted. This could be done under the Trades Marks Act, 1890, Part II., Sections 12, 13, and 15, charging the vendors with "applying false trade descriptions to goods," as provided for under these sections. The penalties imposed under the Australian laws on conviction for offences of this nature are high, and if the cases herein reported were successfully conducted they would have a deterrent effect on the continuation of the fraudulent practice of selling cotton as linen.—Textile Mercury.

A Place That Everyone Likes.

A resort to be popular must have many features which will appeal to the frequenter and no other shore resort can compare with Asbury Park for diversity of attractions. During the past year many improvements have been made at Asbury Park, including a new board walk, a new Casino and Arcade, and in fact the whole beach front is rehabilitated. An exceptional feature is the entertainments provided in the Casino by the Beach Commission of Asbury Park. The best musical talent obtainable is furnished each week and the most recent announcement is the engagement of Duss and the Metropolitan Orchestra for a week of concerts. Madam Schuman Heink is another attraction booked and during the entire season there will be first-class bills. There are excellent bathing facilities and in every way the new Asbury Park is the most popular resort of the season. The New Jersey Central has excellent train service to Asbury Park and its Harbor fleet comprising the steamers Asbury Park, Monmouth and Sandy Hook affords unexcelled opportunities for a delightful trip to the shore. An illustrated Sea Shore book will be sent to any address by C. M. Burt, G. P. A., New Jersey Central, New York City, upon receipt of 6 cents in stamps.

Colored Bird's Eye View of Lake Winnipesaukee.

Lake Winnipesaukee, New Hampshire's queenly lake, is one of the most beautiful lake resorts in the country. The nearby mountains afford a fine view from the steamer Mt. Washington on a clear day, and the island dotted surface of the lake presents a beautiful scene.

Persons who have ever visited Winnipesaukee will be greatly interested in the new publication issued by the General Passenger Department, Boston & Maine Railroad, Boston. It is a bird's eye view map of Lake Winnipesaukee, showing the numerous islands, coves, glens and ports on the lake and a table giving the name of each number.

It will be mailed upon receipt of six cents in stamps.

The St. Louis Exposition.

Mid-summer, and the St. Louis Exposition is drawing thousands. This year many people are spending their summer's vacation on the Mississippi viewing the world's greatest Exposition. The "Pike," with its all absorbing amusement features, is the great rendezvous for the crowds. Here are Hagenback's Menagerie of wonderfully trained wild animals; the Tyrolean Alps, the Galveston Flood, the Creation; and hundreds of other reproductions, all interesting.

The exhibits of art by the world's greatest masters; the exhibit in Anthropology of specimens of various races from almost every section of the earth; the foreign cities, so faithfully reproduced, particularly the Filipino exhibit; the historical relics; the handsome buildings of the foreign countries; the Plateau of States, where each state has its representation; the great modern mechanical devices and machinery; the grand figures sculptured in plastic art; the artificial lagoons and rivers; the grand festival hall and cascades; the beautiful landscape gardening and the architectural beauty of the buildings make the St. Louis Exposition a small world of inconceivable magnificence and beauty.

To get a fair idea of the exposition, its displays, etc., also the routes and rates going from New England, send to the Boston & Maine Railroad for the delightfully illustrated booklet containing 40 pages of interesting reading matter. This book will be sent free to any address. Just drop a postal to the General Passenger Department, Boston & Maine Railroad, Boston, and it will be mailed to you.

Notice of Consolidation.

Among the notices received at this office is one announcing the consolidation of the Globe Machine Works and the Penn Foundry and Machine Co., under the firm name of the Globe Machine and Foundry Co., composed of Charles Denn, William A. Denn, Walter G. Denn and James Conley. The combined business will be conducted with increased facilities at the present address at Frankfort, Philadelphia, Pa.

Recent Textile Patents.

CARDING ENGINE FEED. 766,486. Colonel M. Barber, Monson, Mass.

CLOTH CUTTING MACHINE. 767,076. Chas. D. Mattison, Harbrouck Heights, N. J.

CLOTH PRESSING MACHINE, Rotary. 765,692. George W. Voelker, Woonsocket, R. I.

It is frequently advantageous in pressing cloth in rotary presses to give it a lighter pressure, and consequently a different and softer finish than the machine will do, and the object of this invention is to make it possible by the use of attachments to be added to rotary cloth-presses. To prevent the beds from coming too near the roll, and thereby pressing the cloth more than is always desirable, and yet at the same time to permit the press to be readily opened for the insertion of a new piece of cloth, a collar partially surrounding the axle and made in two pieces, is placed upon the axle or bearing of the roll (shown as E E in Fig. 1). Rods e e pass through the upper extensions of the two portions of the collar and are made rigid in one portion by set-screws, while the other portion is free to move upon them and by reason of the slight space between the two portions take up any wear upon the inside of the collar, so that it will always press closely upon either side of the axle B.

CLOTH WINDING MACHINE. 766,098. Charle W. Brown, Athol, S. D.

COTTON GIN. 766,582. Eugene R. Barber, Valdosta, Ga.

COTTON GIN FEEDER. 766,052. Eugene Matthis, Hahira, Ga.

COTTON PRESS. 765,664. James T. Fuller, Calvert, Texas, assigner to Julius P. Workum, Englewood, N. J.

DRYING APPARATUS, 765,666. Max Hecking, Dortmund, Germany.

DYEING APPARATUS. 765,883. Stuart W. Cramer, Charlotte, N. C.

FABRICS WITH GOBELIN-LIKE EMBROIDery Designs. Providing Woven, 765,947. Johanna L. G. Witte, Chemnitz, Germany.

This invention relates to a method of providing smooth woven surfaces or backing fabrics with gobelin-like embroidery designs, and has for its object to facilitate, expedite, and cheapen the manufacture thereof.

According to this method the gobelin is first woven separately by forming a finished design—such as a leaf, spray, foliage, or other subject—without any backing and with the warp-threads, a, protruding and hanging on each side of the design, b, as shown in Fig. 3. The design so prepared is then placed in position on the fabric or backing, c, and temporarily secured by means of pins or otherwise suitably. The ends of the warp-threads, a, are now drawn through the backing material, c, with the aid of hooks or embroidery-needles and are finally knotted together in pairs at the rear of the backing material after the manner indicated in Fig. 2.

FIBER PULLING MACHINE. 765,723. Fred Wilkinson, Petone, New Zealand.

INDIGO. Manufacture of Brominated, 765,996. Albrecht Schmidt and Rudolf Mueller, Hoechst-on-the-Main, Germany, assignors to Farbwerke, vorm. Meister, Lucius & Bruning.

LOOM. 766,975. James W. Sharkey, Boston, Mass.

LOOMS. Brocading Apparatus for Ribbon Weaving, 767,141. Jean P. Gelas, St. Etienne, France, assignor to Societe Gelas & Co., St. Etienne, France.

LOOM BEAM FRICTION LET OFF. 766,086. Walter I. Whitehurst, Baltimore, Md.

LOOM. 767,218. John R. Fitton, Worcester, Mass., assignor to Crompton-Thayer Loom Co., Worcester, Mass.

LOOM. Filling Replenishing. 766,151. Alida M. Marcoux, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHED FORMING MECHANISM. 765,739. Herman F. Klingele, Worcester, Mass., assignor to Crompton-Thayer Loom Works, Worcester, Mass.

LOOM SHUTTLE CHANGING MECHANISM. 765,711. George Schwabe, Bielitz, Germany.

LOOM SHUTTLE CHECKING MEANS. 766,478. Henry Wilkinson, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE MOTION. 766,776. Merrill O. Steere, Pawtucket, R. I., and Simon W. Wardwell, Providence, R. I.

LOOM TEMPLE. Thread Cutting. 766,501. Alfred A. Hull, Knoxville, Tenn., assignor to Draper Co., Hopedale, Mass.

LOOM THREAD CUTTING TEMPLE. 765,687. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM UNDERPICK MOTION. 765,594. John S. Ainley, Huddersfield, and Edward Hollingworth, Dobcross, England, said Hollingworth assignor to Crompton & Knowles Loom Works.

LOOM WEFT FURNISHING MECHANISM. 767,056. Henry I. Harriman, New York, N. Y., assignor to the American Loom Co., Readville, Mass.

LOOM. Weft Replenishing. 767,057. Henry I. Harriman, New York, N. Y., assignor to the American Loom Co., Readville, Mass.

LOOM WEFT TENSION MEANS. 766,511. Benjamin F. McGuiness, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

SPINNING FRAME SPINNING APPARATUS. 767,263. Henry F. Cottle, Dorchester, Mass.

SPINNING MACHINE ROLLER STOPPING Mechanism. 765,890. James Harrison, Manchester, England.

SPINNING RING. Rotary. 767,034. Victor Belanger, Sea View, Mass.

SPINNING SPINDLE AND BOBBIN. 767,011. John E. Prest, Worcester, Mass.

SPINNING, TWISTING OR LIKE MAchines. Mechanism for Driving Flier or Like Spindles of. 765,913. John Boyd, Bothwell, Scotland.

This invention comprises improvements designed for spinning, twisting, winding, and similar machines for fibrous material, and pertains particularly to an improved combination of mechanism for driving spindles of said machinery by which all the spindles on both sides of the frame, or in sections thereof, are driven by one long endless band; and the invention consists, mainly, in using two long central driving-cylinders working side by side, which may be made the whole length of the frame to actuate one or a number of such bands, each band being employed to drive a number of spindles on both sides of the frame, each band being provided with two or more stationary guide-pulleys to bring back latter to the place from which it starts and when necessary (as it is in most cases) to use also in combination with same a movable tension-pulley or some other mechanism for the purpose of tensioning each band.

YARN PACKAGE. 766,175. George W. Foster, Westfield, Mass.

WARPING MACHINE CLOCK MECHANISM. 766,383. Alonzo E. Rhoades, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

WORSTED PREPARING AND SPINNING Machine 765,713. Frederick P. Shaw, Lowell, Mass., assignor to Lowell Machine Shop, Lowell, Mass.

WOVEN FABRIC. 765,961. Thomas B. Dornan, Philadelphia, Pa.

Pennsylvania, Chester. The Runnymede Worsted Mills are being operated with a night and day force.

C. E. RILEY & CO.

65 Franklin Street, BOSTON, MASS.

BUILDERS AND IMPORTERS OF

COTTON WOOLEN WORSTED

MACHINERY

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HOWARD & BULLOUGH, Ltd., Picking, Revolving Flat Cards, Electric and Mechanical Stop Motion Drawing, Slubbing, Intermediate, Roving and Jack Frames, Spinning and Twisting, New Patent Self-Acting Mules, Spoolers, Warpers and Slashers,

RICHARD THRELFALL, Patent Fine Spinning Mules, 100s to 350s.

HALL & STELLS, Worsted Machinery.

CONSTRUCTION DE MACHINES, Ci-Devant, F. J. Grun. French Worsted Machinery.

HOYLE & PRESTON, Noble Combs, Back Washing Machines, etc.

JAMES TOMLINSON, Ltd., Cotton Waste Machinery; Engine Cleaning and Hard Waste Breaking Machines, etc.

JOHN HAIGH & SONS, Ltd., Woolen and Worsted Cards, Fearnoughts, Feeds, etc,

THOS. BROADBENT & SONS, Hydro Extractors, Patent Suspended Steam and Electrical Driven, Machines kept in stock in Boston.

JOHN WHITELEY & SONS, Card Clothing for Cotton; Tempered Steel, Plough Ground, Needle Pointed.

L. M. TETLOW & SONS, Card Clothing for Woolen and Worsted; Tempered Steel, Needle Pointed.

J. GREENHALGH & SONS, Cotton Waste Willows, for Fly, Strips, Picker Droppings, etc.

DRONSFIELD BROS., Ltd., Grinding Rolls and Emery Filleting. Stock kept in Boston.

SPINDLES, FLYERS, FLUTED ROLLS, ETC.

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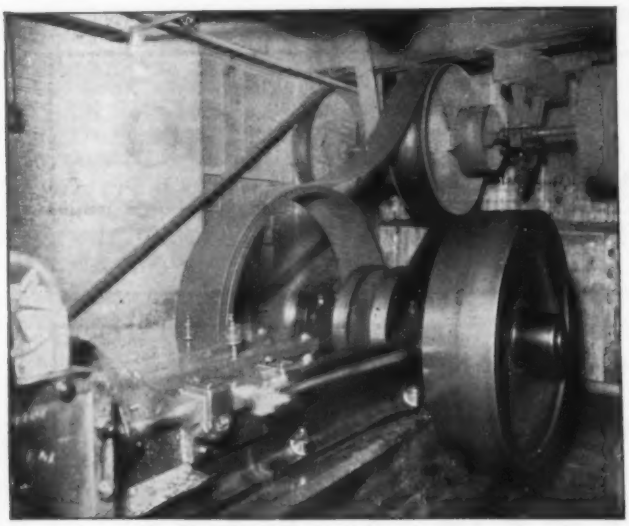

SHORT CENTERS.

PENINSULAR TOOL MFG CO

DETROIT MICH Jan 21 1904

CLING-SURFACE Co Buffalo N Y

Gentlemen:—Herewith find photograph of our main belt which we consider a good example of the new method of running belts with Cling-Surface which live manufacturers are taking advantage of.

It is of special interest because of the belt's being able to carry full load on such short centers and yet run slack, without slipping.

The engine is 35 H. P., 180 R. P. M. The belt is double leather, 10" face, 8' centers. Main pulley 4'6" and driven pulley 4'. There is 15" slack in the belt.

We have used Cling-Surface in this belt since January 5, 1903, and today it is pliable, in the best condition, and not sticky, but with a surface clean—looking and feeling like black velvet.

We never have to take it up and it does its work daily, overloads or underloads, with no complaint or nursing.

PENINSULAR TOOL MFG CO

H W BULL Sec'y and Treas

This belt shows how absolutely Cling-Surface stops belt slipping and without any adhesion. Note how steady it is. Power delivered as positively and evenly as a direct connection.

You have looked for Cling-Surface for many years. Now it is ready for a trial and satisfaction or money back. Anywhere, any time. Order for trial.

Cling-Surface Co 199-205 Virginia St Buffalo N Y

NEW YORK BOSTON PHILADELPHIA

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Lunkenheimer Cups are used wherever oil and grease are used. They are acknowledged standards. No other makes possess the essential features found in a Lunkenheimer Cup. Made of few parts, devoid of clap-trap mechanism, perfect feed control. Specify Lunkenheimer and order from your dealer. Write for catalog.
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CINCINNATI, OHIO, U. S. A.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accident Cabinets.
Putnam & Co.

Accountants, Public.
Garry, Brown & Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.

Appraisals.
Audit & Appraisement Co. of America, The.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Stearns & Castor.
Suck, Adolph.

Auditors.
Garry, Brown & Co.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S. & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Smith, Jas., Woolen Machinery Co.
Woonsocket Machine & Press Co.

Automatic Shuttle and Loom Attachments.
Asala Co.

Balling Machine.
North Chelmsford Machine Co.
Torrance Mfg. Co.

Bandings.
——See under Yarns.

Baskets.
Lane, W. T. & Bro.
Morris & Co.

Belting.
Houghton, E. F., Co.
Jeffrey Manufacturing Co.
Main Belting Co.
Shultz Belting Co.
Smith, Jas., Woolen Mach. Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Houghton, E. F., Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Diamond Drill & Machinery Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Besson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Mass. Fan Co.
Parsons Mfg. Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbin Covers.
Kolb, Frank E.

Bobbins, Spools, Shuttles, Etc.
Leigh, Evan A.
Tebbets, E. L. & Co.

Boilers.
——See Steam Boilers.

Boiler Arches, "Steel Mixture."
McLeod & Henry.

Boiler Furnace Equipment.
Parsons Mfg. Co.

Boiler Setting.
Harris, J. B.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Box Shooks.
Tifft Bros.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass (Perforated).
——See under Perforated Metal.

Brooms.
Philadelphia Broom Co.

Brushes.
Felton, S. A. & Son Co.
Mason Brush Works.

Brushers.
——See Napping Machines.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.

Burlaps.
Stoddard, Haserick, Richards & Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.

Card Clothing.
Ashworth, Elijah.
Leigh, Evan A.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Howard Foundry & Mch. Wks.
Philadelphia Textile Machinery Co.
Smith, Jas., Woolen Machinery Co.

Castings.
Schofield, Wm., Co.

Chemicals.
Grasselli Chemical Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little & Walker.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Fettes & Randall Co.
Riggs & Brothers.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Shryock, J. K.

Cloth Extractors.
Eaton, Wyman.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Eaton, Wyman.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Hunter, James, Machine Co.
Reeves Pulley Co.
Smith, Jas., Woolen Machinery Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Townsend, Thomas.

Combustion System.
Harris, J. B.

Conveyors, Pneumatic.
——See Blowers & Blower Systems.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co.

Cop Tubes.
——See Paper Tubes.

Copper (Perforated).
——See under Perforated Metal.

Copper Print Rollers.
Taunton, New Bedford Copper Co.

Coppersmiths.
Beer, Paul.
Badger, E. B. & Sons Co.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
Atherton, A. T., Machine Co.
American Drying Machinery Co.
Ashworth, Elijah.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.

Alphabetical Advertising Index, with page numbers, follows this list.

Cotton Machinery—cont.
Kilburn, Lincoln & Co.
Kitson Machine Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rheinhauer, D. & Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schaellibaum, Robert, Company.
Schofield, Geo. L.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.

Cotton Waste.
Becker, C. W.
Blaisdell, S., Jr., Co.
Charles, W. B.

Crating Strips.
Tifft Bros.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.).

Dating and Time Stamps.
Riggs & Brothers.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Eaton, Wyman.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Hartford Blower Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Cranston Worsted Mills (yarns).
Davidson, J. F.
Drexler, W. M. & Co.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Keystone Fast Black Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Providence Mills Mfg. Co.
Rowland, Samuel.
Vacuum Dyeing Machine Co.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Machine Works.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Dubois, A. N.
Eaton, Wyman.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Gessner, David.
Heathcote, John & Son.
Hopkins Machine Works.
Howard Foundry & Mch. Wks.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Leigh, Evan A.
Leyland, Thos. & Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Smith, Drum & Co.
Smith, Jas., Woolen Machinery Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Dillon & Co.
Dubois, A. N.
Grasselli Chemical Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Fortner, L. B.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Holliday & Sons, Ltd.
Johnson, Chas. A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
Roessler & Hasslacher Chemical Co.
Schoen & Schlichter.
Selling Co., The.
Solvay Process Co.
Sykes & Street.
Thayer, Ed. M.
Vila, H. S.

Dynamos and Motors.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Co.

Edgings.
——See Tapes, Braids and Edgings.

Electrical Construction.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
General Electric Co.
Hartford Blower Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
Allis Chalmers Company.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis Chalmers Company.
General Electric Co.
Mechanical Appliance Co.
Sturtevant, B. F., Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Howard Foundry & Mch. Wks.
Jeffrey Manufacturing Co.
Morse, Williams & Co.
Salem Elevator Works.

Employees' Time Recorders.
Pettes & Randall Co.
Riggs & Brothers.

Exhaust Heads.
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.
Sturtevant, B. F., Co.

Expert Accountants.
Garry, Brown & Co.

Fans—Exhaust and Ventilating.
——See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co.
Roberts Filter Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Pittsburgh Gage & Supply Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
——See Automatic Feeds.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Pittsburgh Gage & Supply Co.
Roberts Filter Co.
Scaife, W. B. & Sons.

Finishing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Haskell-Dawes Mach. Co.
Lawson, Samuel & Sons.
Leigh, Evan A.

Fluted Rolls.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Leigh, Evan A.
Textile Machinery Co.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
McKeon, John F.

Friction Clutches.
——See Clutches.

Friction Cones.
Evans, G. Frank.

Fuel Economizers.
Green Fuel Economizer Co.
Parson Mfg. Co.

Furnace for Boilers.
Harris, J. B.
Parson Mfg. Co.

Alphabetical Advertising Index, with page numbers, follows this list.

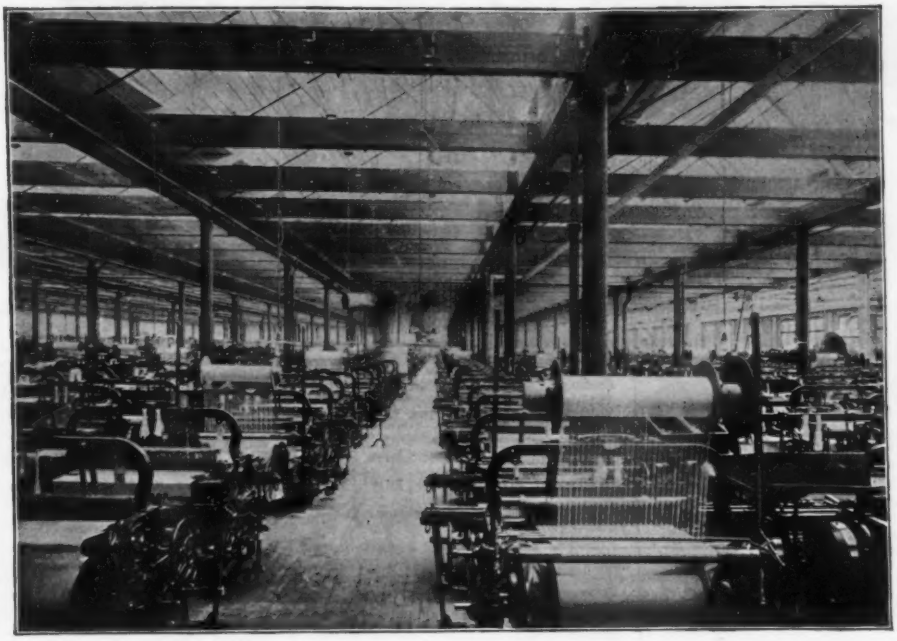
TEXTILE MILLS

are thoroughly and economically

Heated and Ventilated

by the

STURTEVANT SYSTEM



WEAVE SHED, SOULE MILL, NEW BEDFORD, MASS.

This extensive weave shed is heated and ventilated by the Sturtevant System. Two stand pipes admit air under pressure and distribute it throughout the building; equal heating results. With this system exhaust steam is utilized, humidity regulated and the quantity and quality of the air varied at will. There are no scattered steam pipes, the whole apparatus being centralized and under one man's control.

New York
Philadelphia

B. F. STURTEVANT CO.

Chicago
London

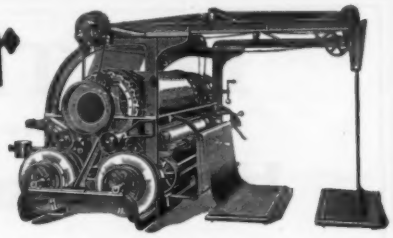
BOSTON, MASSACHUSETTS

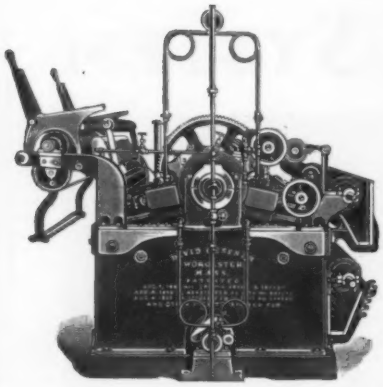
General Office and Works, Hyde Park, Mass.

370

David Gessner

Worcester, Mass.

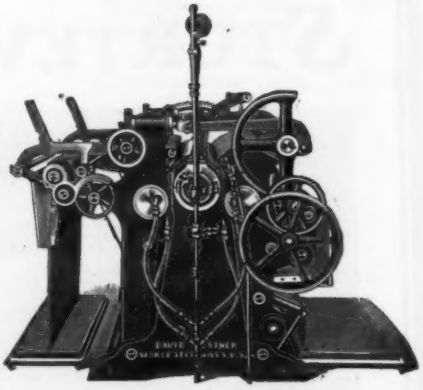




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fulling Mills for Woolen Goods.
Hopkins Machine Works.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Smith, Jas., Woolen Machinery Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
Walworth Manufacturing Co.

Gears.
New Process Raw Hide Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Parsons Mfg. Co.

Grids for Cotton Openers.
Schaellibaum, Robert, Company.

Heating.
—See Ventilating.

Heddles.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Printer.
Bray, John.

Hoists and Hoisting Machinery.
Larrabee, John E.

Humidifying Apparatus.
American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Injectors.
Lunkenheimer Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Sheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Bridoux, Charles H.
Craw, J. W., Laundry Machinery Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Union Special Machine Co.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Branson Machine Co.
Paxton & O'Neill.
Stafford & Holt.
Stanton & Lewis.

Knitting Machinery.
American Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kennedy, Thos. (Cutters, etc.).
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Lindley, Geo. W.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
McMichael, A.
McMichael & Wildman Mfg. Co.
Mueller, Arthur.
Muller, Julius.
National Automatic Knitter Co.
Newton, E. A.
Nye & Tredick Co.
Paxton & O'Neill.
Pepper Machine Works.
Quaker City Stop Motion Co.
Rheinauer, D., & Co.
Richter, Wolfgang.
Schoebel, Walter.
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.

Knitting Needles and Supplies.
Branson Machine Co.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Grosser Knitting Machine Co.
Ives, Loyal T.
Keystone Knitting Machine Mfg. Co.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Rheinhauer, D. & Co.
Treat, Orien.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Alphabetical Advertising Index, with page numbers, follows this list.

The New

Crompton-Thayer Loom Company

.. MANUFACTURERS OF ..

FANCY LOOMS

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

Dobbies, Box Motions and Supplies.

WORKS AND OFFICES:

677 Cambridge Street, Worcester, Mass.

Leather.
Houghton, E. F., Co.

Leveling Apparatus for Shafting.
Eaton, Wyman.

Loom Pickers.
Garland Mfg. Co.

Looms.
Amala Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Howard Fndy. & Mch. Wks. (For Wire).
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

Lumpers.
Gerry, George & Son.
Schofield, Wm. Co.

Machinery Dealers.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Pittsburgh Gage & Supply Co.
Schofield, Geo. L.
Taylor, James.

Machinists' Tools.
Curtis & Marble Machine Co.
Whiton, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercerizers.
Blissville Mills.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.
Maryland Bleach & Dye Works.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Niederlahnsteiner Maschinenfabrik.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.

Mill Architects.
——See Architects and Mill Engineers.

Mill Brushes.
——See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
——See Sewing Machines and Supplies.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Buckley's, Benj., Son., Gun Mill.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Houghton, E. F., Co.
Jefferson, Ed., & Bro.
Jeffrey Manufacturing Co.
Kolb, Frank E.
Lane, W. T., & Bro.
Larrabee, John E.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W., & Co.
Philadelphia Drying Machinery Co.
Philadelphia Broom Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Rheinhauer, D. & Co.
Riley, C. E., & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Thurston, A. G., & Son.
Tucker, W. W. & C. F.
Ward & Vandegrift.
Walworth Manufacturing Co.

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Pittsburgh Gage & Supply Co.

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——See Commission Merchants.

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Mitchell, James E., & Co.
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Monument Mills.
Queensbury Mills.
Skerry, A. T., & Co.
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leading foreign manufacturers and dealers and keep thoroughly up with the latest inprovements in Textile Machines. We should be pleased to com-

Richards

municate with parties contemplating any additions or changes in mill equipments and to send circulars describing at length, our machines and supplies.

& Co.

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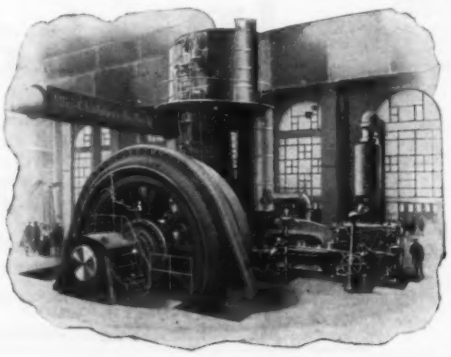

WHAT IT HAS DONE

Began unloading from train Jan. 15th—27 carloads—Generator 10 carloads.
Steam first turned on April 20th, Engine and Generator operated perfectly ever since.
St. Louis Exposition officially opened April 30th, 1904.

Decorative lighting of Exposition Buildings and Grounds first turned on evening April 29th, this Engine and Generator carrying the load.

Ran non-condensing one month while Exposition was getting its condenser plant erected and connections made. During that time carried 4300 horsepower night after night.

Sometimes required to operate the Cascades,—2000 horsepower.

Exposition having finished its condenser plant, the Engine was required to take full load June 10th. That night the unit carried 4800 horsepower. Began with 26 inch vacuum—no load—which, under load, ran down to about 14 inch, or 7 to 8 pounds. Engine has never been out of commission, except for two nights when a sewer burst and flooded the wheel-pit.

Since then Engine ran condensing until July 25th,—carrying 4800 horsepower with from 13 to 16 inches vacuum. On July 25th a break occurred in the Exposition discharge pipe which takes the condenser water to the Lagoon. The engine then ran non-condensing for two nights. It carried 4400 horsepower during that time. On July 28th ran condensing,—since then it has regularly carried 5600 horsepower with 15 inches vacuum.

The "Big Reliable"

Bullock
Electrical Apparatus for all purposes.

Canadian representatives, Allis-Chalmers-Bullock, Ltd., Montreal

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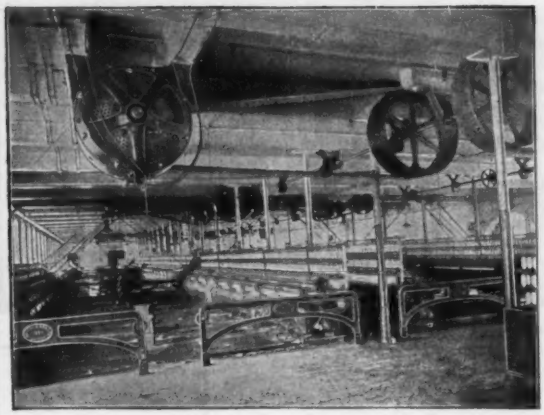

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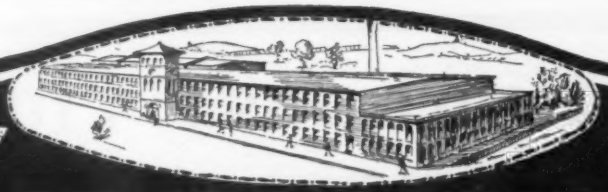

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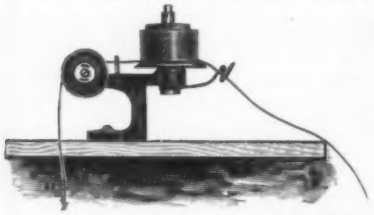

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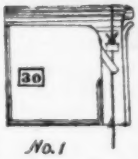


No. 1

Making cut marks on warps, use my loom clock on your looms, and get cuts of uniform length. It will also facilitate keeping a close record of your daily production, and enable the weaver to know at all times just what he is doing, which means increased production. With the new roller attachment it can be applied to woolen, cotton or silk looms, also to various other machines for measuring cloth or yarn. Will work on positive take-up woolen looms without roller attachment. Price of clock, without roller attachment, 50 cents each; with roller attachment, 60 cents each. Postpaid to any address. Liberal discount on quantities. Circulars on application.

L. M. PHELPS, Blackstone, Mass.

TEXTILE MACHINERY

Large lot of Cotton, Woolen and Worsted Machinery of all kinds for sale. Best Prices paid for first-class second-hand machinery.

J. K. Lamb Textile Mach. Co.

246 Chestnut St.,
PHILADELPHIA, PA.

Long Distance Telephone.

MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable men who are entered on our list, and can usually supply their wants in this way.

BLEACHERY SUPERINTENDENT WANTED.

Man experienced in clay filled bag work. State experience, references, salary expected. Apply Fulton Bag & Cotton Mills, Atlanta, Ga.

HELP WANTED.

BOSS KNITTER for large mill making 1500 dozen Cotton Seamless Ladies', Men's and Ribbed Hosiery per day. Good position for first class man.

Write us stating salary expected, what experience, on what machines, and in what mills, and give your references. Address, "P. K. R." care Textile World Record, 299 Devonshire Street, Boston, Mass.

WANTED.

A Felt Mill manufacturing Felts that are only used in paper mills, wants a first-class Superintendent. Will only consider those who have had the experience outlined above. Address H. C. WILSON, care Hapgoods, Brain Brokers, Suite 508, 309 Broadway, New York City.

WANTED GOOD RELIABLE AGENTS

In Eastern and Middle States, to handle fine dress goods as a side line. Address "Matrix," Textile World Record, Boston, Mass.

Wanted. Experienced man on German Double Rib Machines. Address "German," Textile World Record, Boston.

Wanted. First-class loom fixer for Crompton looms running on fancy cassimeres. Wages twenty-five cents per hour. Address, "Looms," Textile World Record, Boston.

Lamb Knitter Wanted. To take entire charge of Lamb knitting machines working on gloves and mittens. One familiar with French is preferred, but not necessary. Address "Athletic," Textile World Record, Boston.

Wanted. Competent manufacturer on circular toque and skirt machine. Highest wages. Steady employment. Give references and wages expected. Address "Toque," Textile World Record, Boston.

A THOROUGHLY PRACTICAL AND UP-TO-DATE SUPERINTENDENT

Wanted for the underwear department of a representative mill. Mill's capacity about 150 dozen per day of men's and boys flat balbriggan goods. Must be competent to take charge and posted in the latest methods of handling and finishing this class of goods. A good salary to the right man. Address "Balriggan," Textile World Record, Boston, Mass.

WANTED—A BOSS DYER

to take charge of a dye house. A young, energetic man, who is familiar with modern methods. Capacity about 1,000 lbs. of cotton yarn in skeins per day in a variety of shades. We also bleach about 1,000 lbs. per day of cotton braids. A permanent position and fair wages to the right man. Address "Cotton Braids," Textile World Record, Boston, Mass.

WANTED.

Assistant manager about thirty-five years of age. Man with executive ability to manage a knit underwear mill making fine grades of cotton, worsted, silk and silk mixtures. Latch needle machines. One who is thoroughly acquainted with all parts of the business and who can establish a good system. Address "Excellent," care Textile World Record, Boston, Mass.

SITUATIONS WANTED.

FIRST-CLASS DYER,

Twelve years in present position, is open to change. Well up in fancy worsted, wool and cotton, both loose and in the yarn; fast colors. State salary prepared to pay. Address, "EXPERT," care Textile World Record, Boston.

Assistant Designer is open for engagement, accustomed to all kinds of men's wear, woolens and worsteds. Address F. D. T., corner Lincoln and Grotto Ave., Providence, R. I.

Dyer. First class on fast black, open for position. Best of reference and experience. Go anywhere in Pennsylvania; married. Address "Black," Textile World Record, Boston.

Position Wanted. By a thoroughly experienced bleacher and dyer of cotton, cotton and wool mixtures, mercerized and wool, all fibres bleached successfully with Peroxide of Sodium process, A1 reference, married, terms moderate, will not go West or to Canada. Address "Bleacher," Textile World Record, Boston.

A Good Position is always open for a competent man. His difficulty is to find it. We have openings for high grade men in all capacities: executive, technical, clerical, paying from $1,000 to $10,000 a year. Write for plan and booklet. Hapgoods (Inc.), Suite 511, 309 Broadway, New York.

Position Wanted by Knitter, thoroughly experienced on all kinds of latch needle machines, fancy stitch, plain plated and shaped goods, in all grades of yarn. Married. Terms moderate. Address, Knit Goods, Textile World Record, Boston.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid-in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

COTTON SUPERINTENDENTS.

Superintendent Cotton Mill open to a position. Age 33; American; married. Good experience as overseer of carding in large mills. Combed and carded hosiery yarns, shirtings, sheetings, cheviots, madras. First-class references. 2096, Textile World Record.

Superintendent. Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 2095, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent. Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Assistant Superintendent or boss weaver of cotton mill. Twenty-five years' experience. Unquestionable references as to character and ability. Thoroughly acquainted with plain, fancy box or lappet looms. Can take place on short notice. 3034, Textile World Record.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent of small woolen mill. Piece dyed goods, thibets, Venetians, meltons, etc. 3114, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent. American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3034, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. Will not go West, South or to Canada. First-class references. Graduate of Philadelphia Textile School, and also had good practical experience. 3126, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent and Designer. Age 30; American; married. Cotton warp, worsted and silk vestings, tapestry curtains, plaid backs, broadcloth, etc. 3146, Textile World Record.

COTTON CARDERS.

Overseer of Carding Room. Age 50; Scotch; married. Good experience, and excels on fine combed work. Wants N. E. States, or Southern. 3144, Textile World Record.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin e and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Carding or Superintendent. Wide experience in large mills. Age 42; married. Finest of references. Will take large carding or superintendency. Familiar with all counts. 3133, Textile World Record.

Overseer Cotton Carding. Age 35; married; 12 years' experience as overseer. Worked on all kinds of yarns from 10's to 150's, combed and carded, and is familiar with all makes of English and American machinery. 2075, Textile World Record.

WOOLEN CARDERS.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2093, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Overseer of ring spinning, spooling, warping and dressing. Will not go South. Middle aged; American; married. Good experience and references. 3059, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Sheetings, sateens, ginghams, and dimities. Will not go South. 3116, Textile World Record.

Overseer of Weaving wants position. Practical experience from weaver, loom fixer, secondhand to overseer, on all kinds of looms and make of goods. References. Good manager of help. Married man; 35 years of age. 1806, Textile world Record

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2052, Textile World Record.

Superintendent of Weaving. Englishman; married. Worked on fancy worsted and cotton dress goods and men's wear. First-class recommendations. 3111, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

DYERS.

Boss Dyer. Scotch; married. Wool, worsted, carpet and cotton yarn, piece goods, dress goods, raw stock. Will not go West, South or to Canada. Wants $3.50 or over. 3082, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton print goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

Boss Dyer. Scotch: married. Good references. Bleaching, scouring, dyeing and carbonizing in roll or the garment. Raw stock, cotton or wool. Has worked on ginghams, eiderdowns, knit goods. Will not go South or to Canada. 3149, Textile World Record.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Boss Dyer. A young man; married; American. Worked on wool, shoddy, cotton, silk noils, rags, camel's hair and piece dyes on satinets. Will accept $2 per day to start. 3122, Textile World Record.

Boss Dyer, mercerizer or bleacher. Scotch, married. Wool, yarns, piece, cotton and slubbing. Can take place at once. First-class recommendations. Familiar with all the latest improved machinery in the dyeing business. 3097, Textile World Record.

Boss Dyer. Twenty-six years' experience in all in woolen mills, 22 years being an overseer. Middle aged; American; married. Will not go South or to Canada. 3134, Textile World Record.

Dyer. Scotch; married. Cotton and wool skein and hosiery. Mercerizing and bleaching. Excellent references. 3141, Textile World Record.

Wanted, position as boss dyer and bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Boss Finisher. 25 years' experience on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Woolen Finisher. Age 35; American; married; Wants $2.50 or $3.00 per day. Good experience. 3138, Textile World Record.

Overseer of Cloth Room. Age 37; American; married. Wants $18 per week or over. 3110, Textile World Record.

Overseer of Finishing. Age 33; American; married. Meltons, coverts, cheviots, flannels, mohairs, etc. Wants position in New England, preferably Rhode Island. 3129, Textile World Record, Boston.

Boss Finisher. Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

Boss Finisher in a woolen mill. Worked on kerseys, meltons, cassimeres, satinets, cheviots, etc. Wants $3.50 per day. Will not go to Canada or West. 3077, Textile World Record.

KNITTERS.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Boss knitter, sewing machine fixer. Age 28; American. All classes of ladies' and children's knit underwear made on circular latch needle machines. Wants place at once. 3102, Textile World Record.

Superintendent of Factory, manager of cotton and worsted hosiery mill. Expert in starting up new factories or putting an old one into good working order. Has had 30 years' experience. 2047, Textile World Record.

Superintendent knitting mill. Cotton and wool hosiery, heavy mittens, sweaters, toques. Good experience. Aged 45; married. 1291, Textile World Record.

Superintendent Hosiery Mill. Age 22; American; single. Worked on 84 needle goods. Prefers position in the South. 3033, Textile World Record.

Boss Knitter or second hand. Silk, worsted, lisle, cotton and mixed yarns. Is familiar with any latch needle machine. 1819, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

Latch Needle Knitter on N. & T., S. & H., S. & W., McM. & W., Pepper, Lewis Jones, etc., circular machines. Twelve years' experience as boss knitter and superintendent. Wants steady work. Sober, good manager of help, best of references. 3106, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines, Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

Superintendent of knitting mill, or foreman in large plant, is open to position. Had some 15 years' experience as machinist, foreman and superintendent. Familiar with all grades seamless hosiery and most makes of seamless hosiery machinery. Understands business from starting new mills to finish. Perfectly sober and reliable. 3078, Textile World Record.

Position wanted in charge of boarding, pressing, pairing, folding of hosiery, etc. First-class references. 3105, Textile World Record.

Superintendent of a 200 dozen hosiery or assistant of large hosiery. Thoroughly understands the technical and practical parts of machinery and manufacture. Young man. Fine references. 3137, Textile World Record.

Boss Knitter or Sewing Machine Fixer. German; married. Familiar with all makes of knitting and finishing machines on ladies' underwear. Will not go South or to Canada. 3128, Textile World Record.

Superintendent, or Partnership. Wants Western States, Canada, or Pennsylvania. Familiar with nearly all makes of circular hosiery machines. An American; married. 3131, Textile World Record.

Knitting Fixer. A young man; American. Ribbed and seamless hosiery, cotton, lisle and Egyptian yarns. Familiar with McMichael & Wildman ribbers, Paxton & O'Neill and Branson 3/4 automatic and Hepworth loopers. Will not go South. 3130, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record.

DESIGNERS.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Designer. A young man who has had eight years of practical experience in cotton designing wants position as designer or boss weaver. Worked on Marseilles, crochet and satin bed spreads, table covers, ginghams of all kinds, including leno, lappet and all classes of the above. Jacquard work a specialty. 3107, Textile World Record.

Designer. Plain satin, fancy leno, checks, colored and dainties in cotton. Wants $3.50 or over a day. 3043, Textile World Record.

Designer, or assistant superintendent and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill. 1789, Textile World Record.

Asst. Superintendent or Designer. Familiar with men's wear, overcoatings and fancy worsteds. A young man. Taken post graduate course at Yorkshire College, Leeds, England. Attended Philadelphia Textile School a year and graduated from Lowell Textile School. Bright and of good character and habits. 3096, Textile World Record.

Designer or assistant. Worked on woolen and worsteds, cotton worsteds and mercerized goods. Good experience. A young man, single, Swede. 3127, Textile World Record.

MISCELLANEOUS.

Asst. Superintendent of dyeing, printing and finishing plant. Experienced in cotton and silk and capable of turning out finished product. American; 27 and married. Best of references. 3136, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Loom Boss or asst. superintendent. All kinds of worsted goods for ladies' and gentlemen's wear and various classes of cotton goods. Worked in English mills and also in this country. 3151, Textile World Record.

Loom Boss. Age 32; American; married. Also a designer. Knowles, Crompton, Jacquard and dobby looms. Wants $3 per day. 3150, Textile World Record.

Machinist. French; married. Has had full charge of all kinds of repairing. Understands all about boilers, engines, motors and can give best of references. 3090, Textile World Record.

Traveling position with mill supply house. Has been dyer, but mill now closed. 3108, Textile World Record.

Overseer or second hand's position. Understands twisting, warping, spooling and cone winding. Worked on all kinds of cotton yarns. Will not go West or South. 3112, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

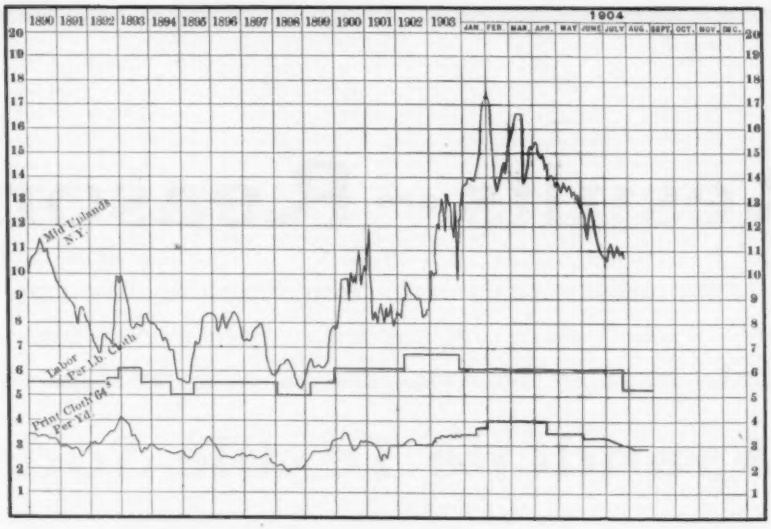

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903
1904
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth 64 Per Yd

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Speculation in raw cotton during the last month has been on a very limited scale. As our chart shows, prices fluctuated within very narrow limits. The general curtailment of production in Europe and in this country, combined with fairly favorable weather conditions and the prospect of a large crop have been the depressing factors. On the other hand there is a firmly rooted conviction throughout the trade that the scarcity of cotton at the mills will prevent any further decline and that even if the predicted increase in the crop materializes, the extra requirements of the mills to replenish their supplies will quickly absorb any surplus. There have been the usual amount of rumors regarding crop damage, but it is well understood that the condition of the crop is satisfactory. There is a very small supply of old American cotton throughout the world, while the stocks of East India and of other grades are about normal.

The total visible supply as reported by the Chronicle of August 20, was 1,257,779 bales, as compared with 1,356,583 bales in 1903, with 1,434,627 bales in 1902, with 1,718,572 bales in 1901. As this date is just before the receipt of the new cotton the figures afford a good opportunity for comparing the statistical position of cotton for the last four years. There has been a steady decline each year in the visible supply and there are 460,793 bales less in 1904 than in 1901. This in connection with the fact that the mills have very little cotton on hand affords a strong basis for the belief in the continuance of high prices for the staple.

Wool Market.

The market has continued strong on all grades of wool, although not as active as a month ago. The demand has been steady, coming from the medium size and smaller mills. The activity in wool has been due to the necessity of covering orders for light weights and there has been no disposition on the part of either manufacturers or dealers to speculate in the raw material. The bitter lesson learned in 1900, the record of which can be easily read on our chart, has evidently not been forgotten by the wool trade and dealers who four years ago were holding fine medium Territory for 65 cents when it was selling for 60, are now satisfied to turn a fair profit at 50. There is a notable absence of small lots of wool, which afford the small dealer and broker an opportunity to speculate in a small way.

The new clip is practically all in the hands of the manufacturers and Eastern dealers and a large part of it is passed direct to the mills without having been stored in Eastern lofts. This indicates that the stock of wool in the country is small and being rapidly taken up by the normal demand among manufacturers. The foreign wool markets are

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

Results are Reasons

No argument appeals more strongly to the busy man than results. Time is more precious today than ever before. The successful man is the busy man, the man who can show results.

Wyandotte Textile Soda

is a result producer, logical, economical, practical; not an accident, but a material whose valuable detergent properties are due to new principles, new facts. We have told you how Wyandotte Textile Soda gives a cleaner, whiter, softer and loftier wool—how it gives to the finished cloth that desirable softness and firmness of texture. We have quoted to you the words of others, telling of their success. We have done more, having repeatedly guaranteed that the result would be all we claimed or cost you nothing.

Then don't argue, don't hesitate, order now

None Genuine except with a card bearing this Trade Mark

In every package.

The J. B. Ford Co.,

Sole Mfrs.

Wyandotte, Mich.

You will be welcome at our Exhibit, Block 56, Aisle B, Agricultural Building, World's Fair, St. Louis.

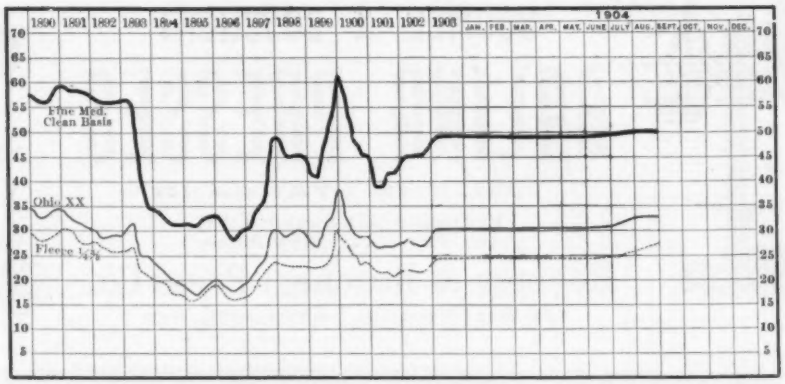


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

strong and prices show an upward tendency. Only one-half of the clean wool consumed in the United States is of domestic growth and the advance in foreign wool makes it more difficult to supply the deficiency from foreign sources. This would naturally lead to a strong advance in domestic wool were it not for the fact that a large supply of wool substitutes is always ready for such a contingency.

Judging by the experience of 1900, fine wool at 50 cents is as high as the demand for goods will warrant. Reports from the goods market are favorable and manufacturers have booked a fair light weight business although there is considerable machinery still idle. There is a strong feeling of confidence in the future and business men are not paying as much attention as usual to the presidential campaign, which ordinarily has a very unsettling effect on trade.

*Massachusetts, Blackinton. Waterhouse and Buffum, lessees of the Blackinton Woolen Mill, recently sold, will remain at their present quarters until January first, when they will remove to the old Eagle Mill, which they have purchased. Work will start at once on equipping the Eagle plant for manufacturing woolen goods.

New Jersey, Little Falls. The Beattie Manufacturing Company, which was shut down for ten days, has resumed operations, running the first three days of each week, making 30 hours.

New Jersey, Paterson. A concern in Switzerland, manufacturing ramie underwear, clippers, shirts, etc., is reported looking for a location at this place. E. Harvey Lambert is corresponding with the parties.

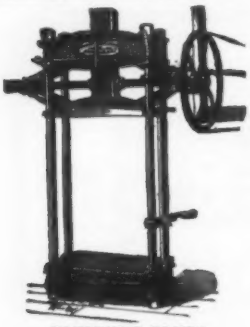
New York, Amsterdam. It is reported that a plant for spinning yarns will be installed in the Mohawk Mills of the Smyrna Rug Manufacturing Co.

Stevenstink Process

SOMETHING NEW
Prevents Woolen Goods from Shrinking
Charles H. Heyer
1501 Real Estate Trust Building
Philadelphia, Pa.

Established 1848. Telephone Connection.
JAMES J. TULLY,
Manufacturer of
Fulling and Scouring Soaps
179-181 Master Street,
MILL SOAPS a Specialty. PHILADELPHIA.

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes
SOLE AGENT,
FRANK A. TIERNEY,
WOOL, TOPS, NOILS, YARNS,
Fine, Medium and Coarse Wool Tops. Mohair Tops. Camel Hair Tops. Fine, Medium and Coarse Wool Noils. Mohair Noils. Camel Hair Noils. Silk Noils.
Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
Room 203, Wool Exchange Building, 260 W. Broadway, NEW YORK.



KNUCKLE JOINT.

BOOMER & BOSCHERT

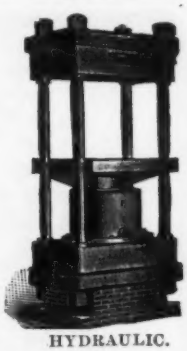
BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size .. Any Power

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.



HYDRAULIC.

EASTON AND BURNHAM MACHINE CO.,

Pawtucket, R.I.

ALL KINDS OF Spindles USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

TO SPOOL FROM COP, SKEIN, OR BOBBIN.

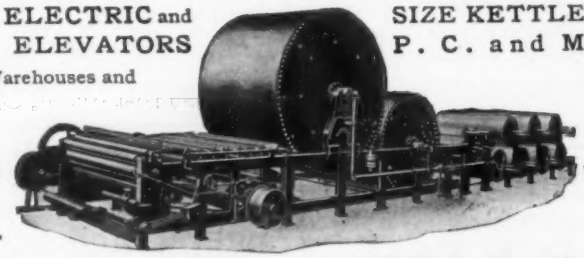
The COHOES SLASHER.

BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO., Cohoes, N. Y.

A Rigid Examination Reveals No Defects in the

CROSBY SPRING-SAVE GLOBE AND ANGLE VALVE.

NO BETTER VALVE CAN BE MADE.

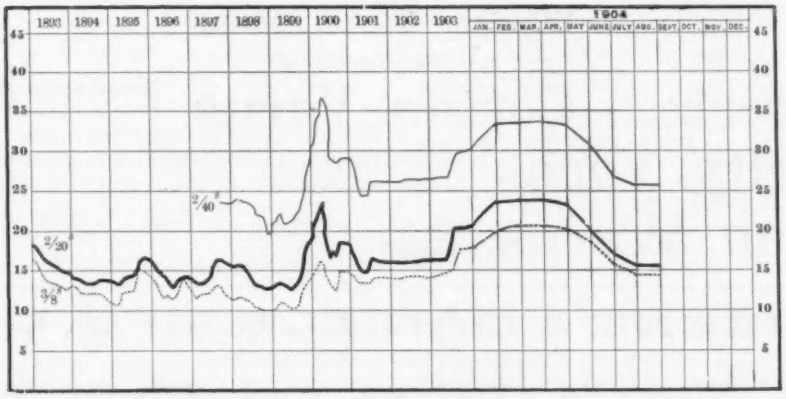
All Working Parts Renewable Without Removal from Piping. ALL PARTS INTERCHANGEABLE. THEY have a full opening through them. WHEN COMPLETED ARE TESTED under more than 400 lbs. pressure. We guarantee them NOT TO LEAK AT HIGH PRESSURES. MADE IN BRASS AND IRON in the various styles furnished to the trade. Try One or More Valves and BE CONVINCED.

CROSBY STEAM GAGE AND VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

The Eastern Yarn Market.

Although raw cotton has declined it still remains at a very high figure and the strong undertone experienced during the last month has been a disappointment to spinners of cotton yarn who hoped that the raw material would go below 10 cents. This fact in connection with the general curtailment in production has strengthened the growing belief that the trade must adjust itself to high priced cotton. Buyers have been hesitating and unwilling to make contracts, professing a faith in the possibility of lower priced cotton on account of the bumper crop that is being freely predicted. Spinners have also shown an unwillingness to bank on the future by making contracts for delivery of cotton yarn and the result has been a stand off, actual business having been confined largely to spot transactions. In the midst of all the conflicting and uncertain factors there is a strong feeling of confidence in the future and a well defined belief that no matter how the presidential election may go business is bound to revive. We quote as follows:

Eastern Cops.

6's	16¾
8's	17
10's	17¼
14's	18¼
16's	18¾
18's	19¼
20's	19¾
22's	20¼
24's	20¾
26's	21¼
30's	22¼
34's	22¾
36's	23
40's	23½

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	18½
14's	19
18's	20
20's	20½
22's	21
26's	21½
28's	22
30's	22½
36's	24
40's	25
45's	28
50's	30
55's	33
60's	36

Eastern Two-Ply Warps, Carded Peeler.

2/30's	23
2/36's	24
2/40's	25
2/45's	29
2/50's	31
2/60's	37

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	33
35's	34
40's	35
45's	36
50's	40
55's	46
60's	48
70's	52

Two and Three Ply Skeins, Combed.

30's	34
36's	35
40's	36
45's	38
50's	41
55's	45
60's	50
70's	55

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

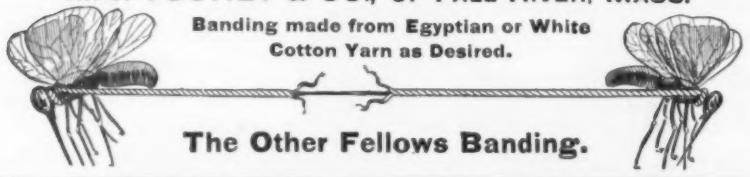
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS. 4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Philadelphia Yarn Market.

Prices on cotton yarn are down to a level that is all out of proportion to the price of cotton. It looks as if a great deal of yarn had been sold on the prospect of cotton going to 8c. or 8 1/2c., when the new crop commences to move. The developments of the end of the month in the cotton market show a strength in the position of cotton which most buyers have not been willing to recognize.

There has been considerable hesitation on the part of buyers about placing orders and a sharp advance in cotton or yarn at this time, or during the next few weeks, would find a great many buyers short. The sentiment regarding a bumper crop seems to have changed somewhat and the prospects are not as favorable as they were early in the month.

The chances are the first offerings of new cotton will be taken out at good prices on account of the stock of old cotton being so low. There has been considerable improvement in the yarn business during the past few days. Manufacturers, however are complaining that jobbers are still holding off. The opinion seems general that the stocks in jobbers' hands are low, and unless the mills are started soon, there will be delay in getting deliveries when the jobbers want them. Prices today are about as follows:

Southern frame spun cones:—

7's and Coarser	16½
8's and 9's	16¾-17
10's	17-17¼
12's	17½
14's	17½
16's	18
18's	18½
20's	19
22's	19½
24's	20
26's	20½
30's	21½
40's	25
50's	32

Southern high grade mule yarn:—

Cones.

10's	17½-18
12's	18-18½
14's	18½-19
16's	19-19½
18's	19½-20
20's and 22's	20½-21
24's	21½

Southern frame yarn, lower grades:—

6's and 8's	16
10's	16½

Eastern cones (high grade quality):—

10's	18
12's	18½
14's	19

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

Mills: Frankford, Pa.

KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

Walcott & Campbell Spinning Co.

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York

J. H. ENGLISH & CO.,

Commission Merchants

COTTON YARNS

108-110 Franklin Street, New York. N. Y.

Consignments Solicited from Southern Mills. Liberal Advances made and Sales Cashed Promptly.

Indian Orchard Company
Cotton Warps and Yarns.
In Gray and all Colors, Single or Two or more Ply, and Cable Cord.
Novelty Yarns.
in Various Patterns, Colors and Twists.
Carded and Colored Cotton.
for Mixing with wool, Machined or in Roving.
Indian Orchard, Mass.

16's	19½
18's	20
20's and 22's	20½-21
Skein yarn (mostly Southern):—	
4's to 8's soft	15½
10's to 12's	16-16½
14's to 20's	16½-17
22's	17
14/2	16
16/2	16-16½
20/2	16½-17
30/2	18-19
40/2	23-24
16/3 slack	16
12/3 slack	16
8/3 carpet	15
8/3 slack	15
9/4 slack	15
Warps (mostly Southern):—	
10's to 12's	15¾
14's	15¾-16
16's	16
20's to 22's	16½-17
26's	17½
14/2	16
16/2	16½
20/2	17
24/2	17½
30/2	18½
40/2	24
Mixed colored yarns (mock twist, half colors):—	
6's to 10's	18-19
12's to 14's	19½-20
16's to 18's	20½-21

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Spinners continue busy with orders secured during July and August from the men's wear trade. This buying developed suddenly after spinners had been short of orders for some months. After securing the first orders prices were advanced all the way from five to eight cents per pound and the spinners who but a short time before had been anxious for orders, developed a very independent spirit. It was pointed out to them that an advance would certainly check the large use of worsted yarn and that the present buying was but a temporary demand. Certain it is that trade has quieted down and weavers are refusing to pay prices asked by spinners. Some predict that before long spinners will want orders. They now talk very loudly about what they must ask for worsted yarn.

Spinners of English spun yarn state that they have all the work they can handle for several months and that when the stock of wool and tops they own is used, they will be unable to sell yarn made from wool based on present wool values at

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps, Cones, Cops, Tubes
COTTON YARNS
426 and 428 Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

American Cotton Yarn Exchange
COMBED and CARDED COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
PERCY H. de MAURIAC, Vice President.
OFFICES: 67 Chauncy St., Boston.
240 Chestnut St., Philadelphia.
108 Franklin St., N. Y. with James Talcott.

F. C. BARTON
MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
54 FRANKLIN STREET, NEW YORK

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

POCASSET WORSTED COMPANY,

Worsted Yarns.

OFFICES:
6th Floor, Banigan Building,
PROVIDENCE, R. I.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

Office and Mill, Delaware and Cooper Streets. CAMDEN, N. J.

Woolen and Merino YARNS

Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,
Highland Worsted Mills,
Loridan Worsted Co.,

17 Bank St., PHILADELPHIA, PA.

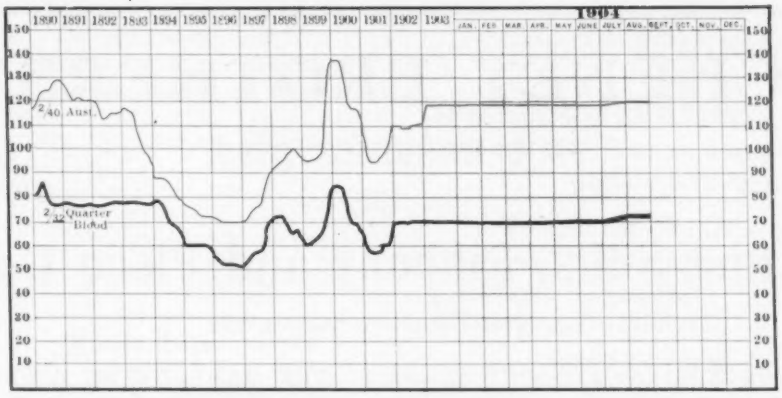


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

anywhere near the prices now being asked. Some of the spinners are so sanguine that prices will be much higher that they are refusing to take on new business, as they state they want their old customers to have the benefit of whatever low-priced stock they own.

It is certain that weavers are not buying heavily and in some instances where they have contracts placed they are not giving spinning instructions. Some weavers state that they have been through these advances before and have just been through the advance and slump on cotton and cotton yarn, and whenever they have bought during the high talk they have always lost money. They contend that an advance based on a short supply alone is not a sound advance, that the only advance which can be maintained is one which comes from an increased demand for the commodity. The weavers state that they are not even getting the proper quantity of orders for this time of year. The weavers who ordered early and who secured orders for cloth early are the favored ones at the present time.

It is an undoubted fact that some of the weavers did not cover entirely for their whole requirements and orders in considerable amounts must be placed later. To show the independence of the weavers, we have but to state that orders which would have given spinners much work were refused because the

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

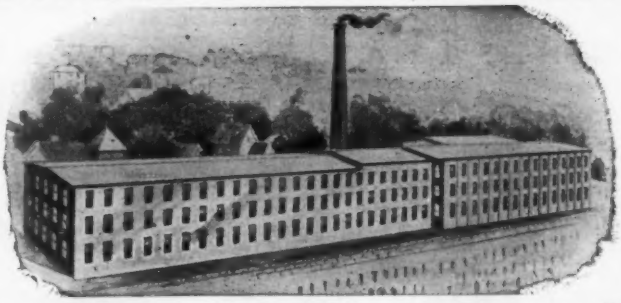
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

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WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

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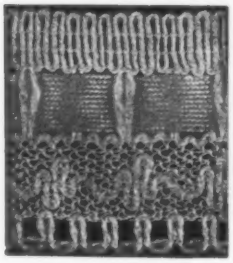
SAUQUOIT SILK MFG. CO.,

Insulating and Braiding Silks.

ORGANZINE, TRAM and HOSIERY SILKS

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Philadelphia, Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., [54 Howard St.—Phila. Office, 4015 Clarissa St. (18th St. and Hunting Park Ave., Nicetown.)—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.



GEORGE W. CHAPIN,

BRAIDS Cotton, Worsted, Mercerized, Cotton and Silk Twilled.
TAPES Common, Twilled, Superfine and Plain 13 to 35s, white and colors on spools.
YARNS Cops, Skeins, Warps, Tubes and Cones.
THREADS on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.
CROCHET LACE EDGINGS Latest Styles in Pant Laces.

229 Church Street 231 . . PHILADELPHIA

weavers would not meet the spinners' ideas as to price. The surplus tops have been cleared out of the market, but the demand for tops is uncertain. Some top makers are very busy. Trade is rather uncertain in spots, but prices are well maintained. We quote as follows:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ⅜ Blood	.75
2/26's ¼ Blood	.68

Woolen Yarn.

Spinners of woolen yarn are getting short of orders. This applies to commission spun yarn as well as to sale yarn, but for all this the commission spinners continue running. Business is slacking up with knitters and weavers, and in some instances they have been forced to shut down for two weeks at a time on account of dull trade. They are holding on to their outside spinners, however, as they consider the present dullness only temporary. They say to the spinner: We must hold the machinery space even though we have to store the yarn made. If you can get temporary work for four or five weeks it would be a favor to us if you will do so; but we do not want to lose our hold on your machinery, and if you cannot get temporary work, keep on our yarn and we will pile it up. After January 1st we would like to take on an additional set of cards.

The spinner trying to please his customer will reply to his weaver customer, telling him he can let him have an additional set of cards for four or five weeks. The party in question tells him that he will take the additional set of cards, not for the short three or four weeks, but for six or seven months, and if he cannot have for the longer period he would not take it at all. Spinners have suddenly had work stopped on them, and for two or three days have believed they would be forced to shut

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So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time Send for particulars.

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WORSTED and WOOLEN
YARNS
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ALSO TOPS.
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Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
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Silesia, Sateens,
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YARNS 40's and above. AND
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GLAZING OF YARNS
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S.W. Cor. Fifth and Market Sts., Phila.

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TRADE MARK
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If you do try a sample and don't send us an order afterward, that's our fault—but we have mighty few faults of this nature.

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Knitting and Weaving YARNS.

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE,
226 CHESTNUT STREET,
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Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

down, but invariably they have secured work at the last moment which set them going again. The spinners of sale yarn have not been so fortunate, and all of them are in a position to take on more or less orders.

The French flannel trade has slackened. Undoubtedly much yarn made from carbonized stock and fancy colored yarn will be used by the dress goods manufacturers next season. The hosiery knitters have largely run out their orders, but are not inclined to take on new orders in quantities as this is the end of the season and cotton seems too high for them. The rubber boot trade will not become active before October. Knitters have some curious ideas as to what price cotton will reach, and this seems to affect the whole industry, on percentage wool yarn and on combed cotton yarn. This also applies to combed Egyptian and peeler yarn where the trade is about 4 cents a pound apart. This uncertainty has curtailed production very much. The time is not far distant when the underwear knitters will get down to business. Cotton yarn will then be wanted for immediate delivery, as no one has any yarn on hand, and the largest spinners in Fall River are shut down on account of a strike.

The price of woolen yarn is very firm, and prices are well maintained on account of the high price for wool. There is very little Australian lambs' wool in the country and prices asked are prohibitive, ranging from 77 to 80 cents per pound. Knitters are using much carbonized Nevada lambs' wool, and are getting good results when nice lots can be secured.

The market for wool in Europe remains very firm, the cross bred wools having the call for business, merino wools being more or less neglected. The prices in Europe are well maintained on all classes of wool, and it is claimed no lower prices will be seen for some time.

Much fine Australian thread waste will be imported the coming season. It is very necessary that this be done, because the domestic spinners have been but poorly employed and the business being secured today is wholly for 1/4 to 3/8 blood yarn, which is too coarse for underwear. Hence, if the knitters want a fine thread it will be necessary to import it. Prices will range from 61 to 66 cents for a fine thread. It is believed that next season Australian lambs' wool will be in better demand. The market for yarn will be much improved within the next 60 days.

WEIMAR BROS. MANUFACTURERS OF **Cotton Mercerized Tapes,**
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street. PHILADELPHIA, PA.

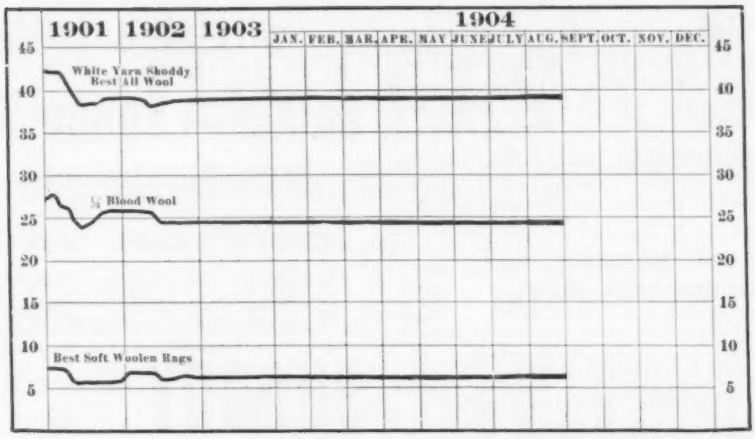

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

Rag and Shoddy Market.

There have been no new features in this market during the last month. A steady business has been done in both rags and shoddy and many dealers have a good supply of orders on their books and are busy preparing and shipping their stock. Some of the less fortunate ones are complaining of dull trade, but in view of the fact that it is the light weight season the volume of business cannot be considered wholly unsatisfactory. Prices of rags are firm and this is due to the unwillingness of collectors to ship their stocks to the large centers. They profess to believe that an advance will take place after election and are holding their property in order to reap the resulting benefit.

The strength of wool creates a feeling of confidence in the rag and shoddy market as an advance of the pure fibre turns the attention of manufacturers to substitutes. Although wool has not yet reached the point where the use of substitutes becomes a craze as it did four years ago, yet it is high enough to lead many to believe that the heavy weight season will show a large increase in the business of low grade goods. Manufacturers of shoddy are complaining that the selling prices of their product are below the level warranted by the cost of rags. We quote as follows:

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	18-20

Serges.

New black	15-16
New blue	14-15

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20

Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

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Of every description. Capacity 7,000,000 pounds per annum.
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Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

SHODDY

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Carbonized Stock a Specialty.

FLOCKS

Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse dark	5-6
Blue	12-13
Blue-seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Printing	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½

Seedy.

½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

COTTON WASTE.

No. 1 Spinners	9¾-10¼
No. 1 Machine	7-7½
No. 2 Machine	5½-6¼
Machine Cop	8-8¼
No. 1 Cop	9-9½
No. 1 Card	9½-10
No. 2 Card	8¾-9
No. 1 Oily Card	5-5½
No. 2 Oily Card	4-4½
Egyptian Card	Limited quantity
Peeler Combing	10¼-10¾
Egyptian Combing	Limited quantity
No. 1 Linters	5¾-6¼
No. 2 Linters	5-5½
White Clips	8-8½
Colored Clips	5-6
No. 1 Picker	2-3½

New Jersey, Paterson. The Dunkerly Mill property was disposed of at public sale recently by the Sheriff, to satisfy a decree secured by the Provident Building & Loan Association. The property was purchased by the complainers for $6,000.

*New Jersey, Somerville. The Somerville Woolen Mills have been adjudged bankrupt by Judge Lanning. The receiver has been authorized to sell the heavy weight cloth and clothing on hand. The first meeting of creditors will be held Aug. 30th.

A. KLIPSTEIN & CO.

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Fast Colors for Wool and Cotton.
Full Line of Direct Cotton Colors.

THIOPHENOL BLACK T EXTRA and 2 B EXTRA.
PYROGEN BLUE R. . . . . .
PYROGEN BLUE B. . . . . .

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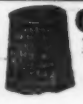

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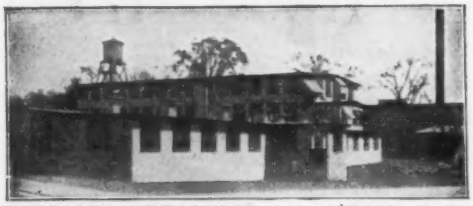

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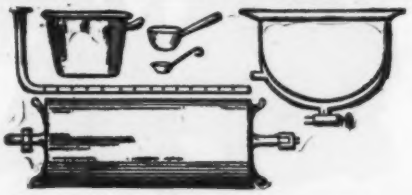

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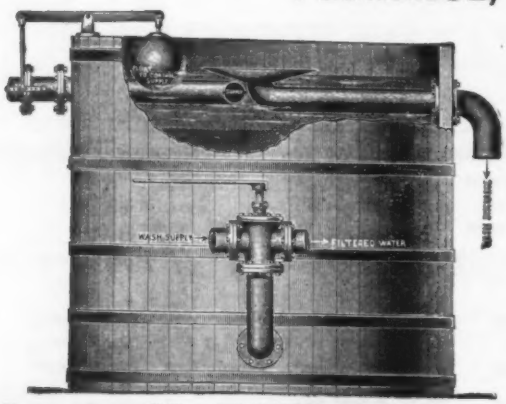

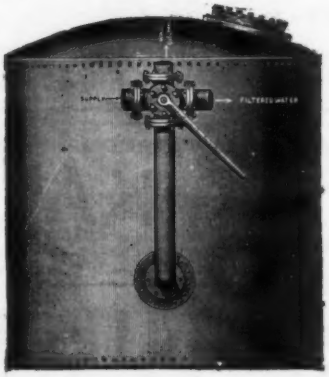

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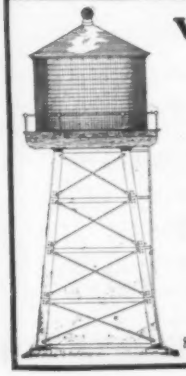

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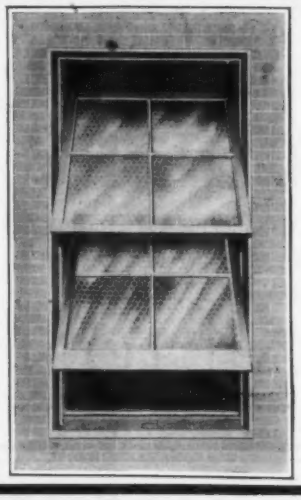

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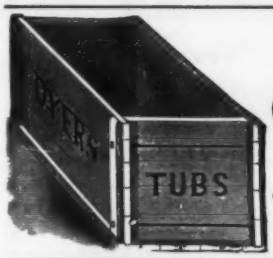

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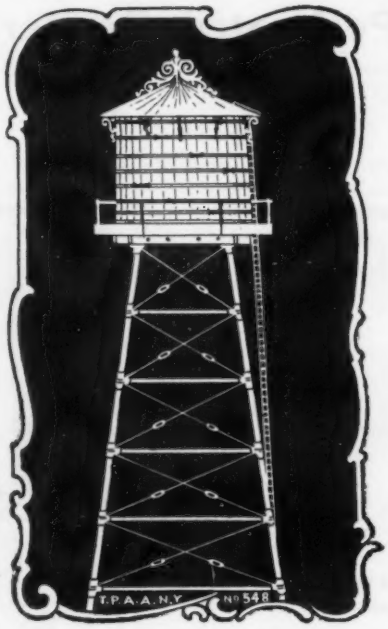

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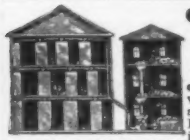

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For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

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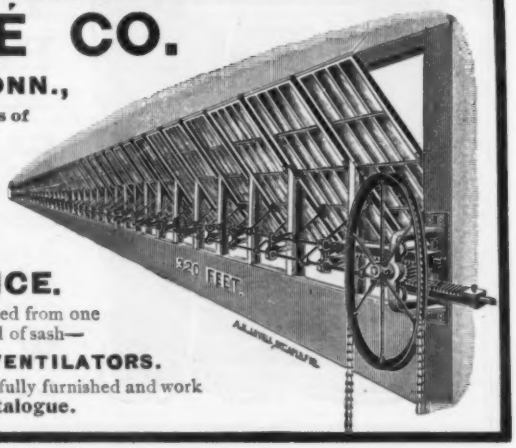

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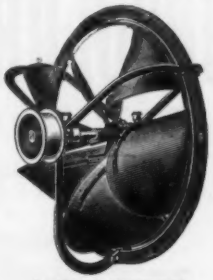

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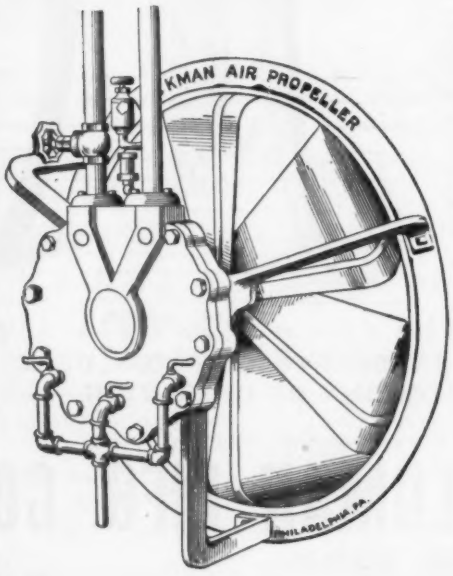

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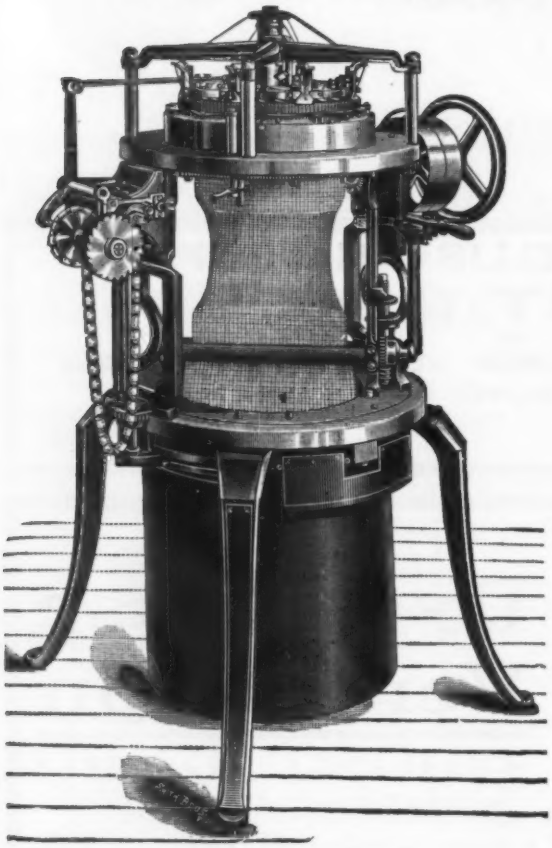
For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



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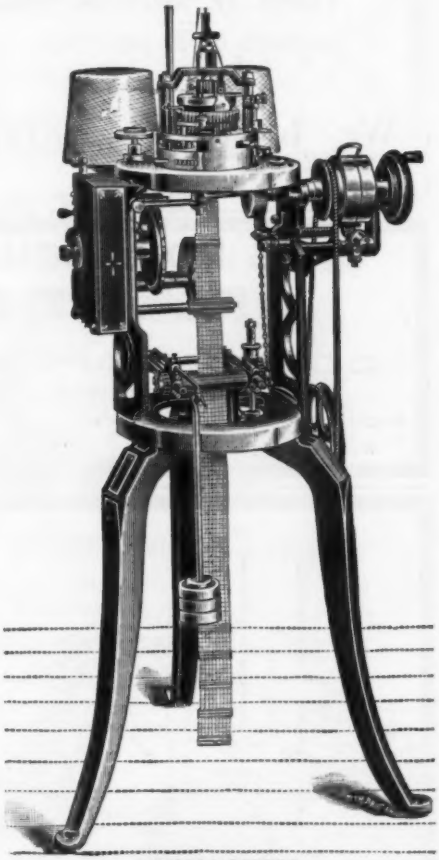

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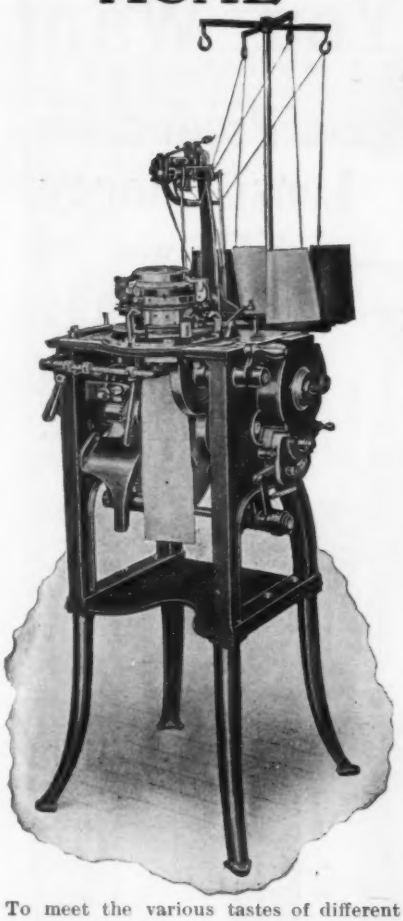

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Two Leaders

Fully Automatic Hosiery Knitters

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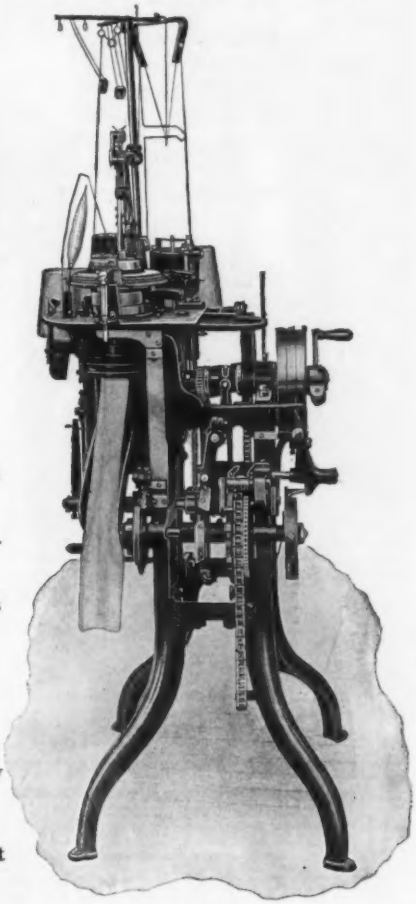

To meet the various tastes of different manufacturers. Both used and approved by leading hosiery manufacturers.

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With these two machines we can supply all the manufacturer's possible wants in the best possible manner.

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We also make all kinds of LATCH NEEDLES.

Many leading manufacturers use our needles and say they are the best on the market.

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For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

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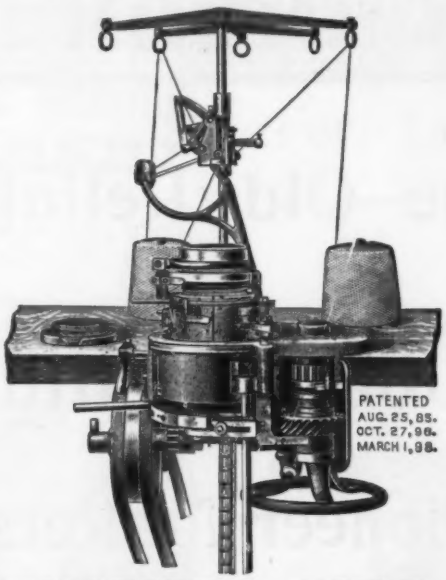

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OUR NEW STYLE 60 MACHINE for Trimming and Overseaming in one Operation produces the strongest, best Seam and does it with the greatest economy.

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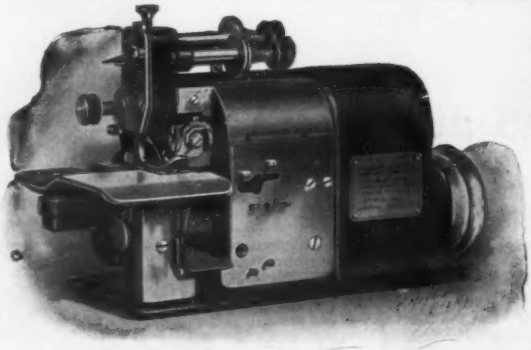
For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



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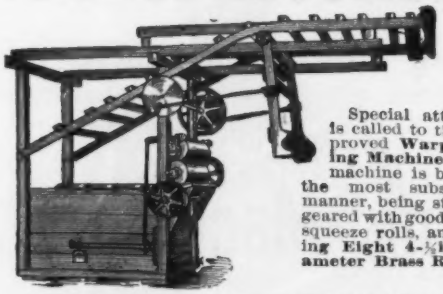

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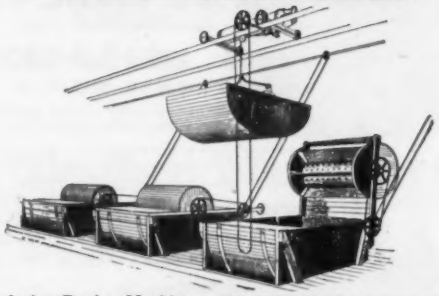

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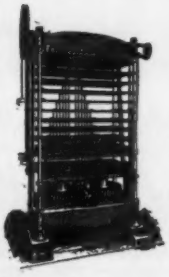

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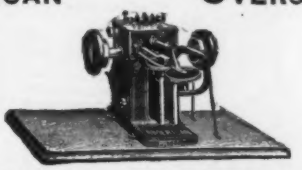

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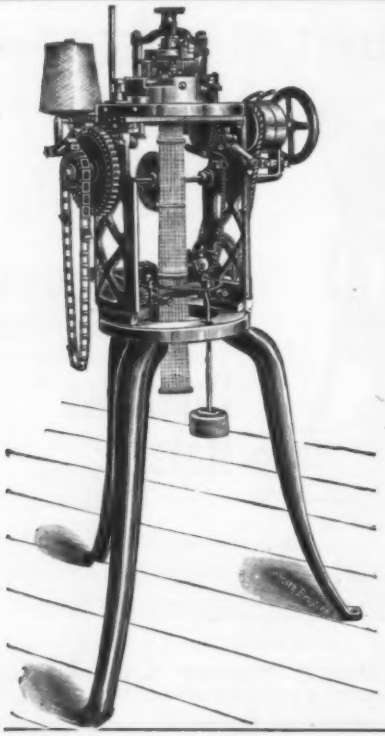

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Complete Estimates Furnished. Send for Particulars.

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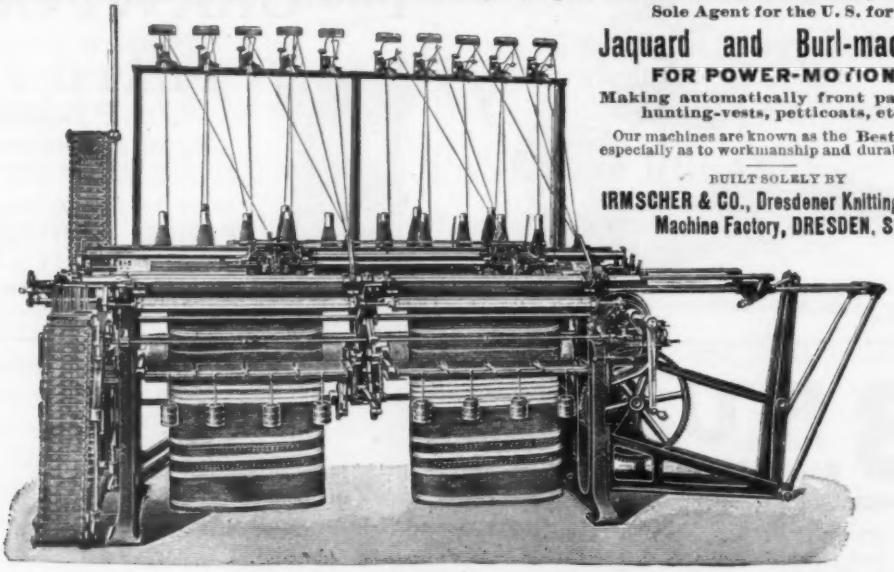

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Making automatically front parts of hunting-vests, petticoats, etc.

Our machines are known as the Best Built especially as to workmanship and durability.

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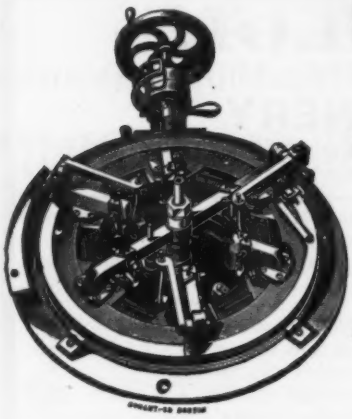
SWEATERS.—This machine is built with 1 or two sections which work together (dependently of each-other) and produces all patterns which could be made hitherto on Hand-Jaquard- and Burl-machines automatically in endless pieces with dividing thread. We are ready to wait on with collection of same which will be the best recommendation, and here we will mention but to following advantage of this machine which is constructed very geniously: It is provided with autom. racking-apparatus as far as 6 needles, special cams for double rib, autom. change of all middle and wing-cams, 2 thread-carriers, autom. change of colors, special attachment for locking in the loops and electric stop-motion in case of yarn-breaking, knots, etc.

All these apparatus are set to work by the pattern-chain, consisting of a number of Jaquard-cards. This new arrangement which is our invention enables the knitter to put together any pattern, making the necessary cards by means of a stamp and after a table we subjoin.

Special Hand and Power Machinery for Fancy Gloves, Sweaters, Golf Hose, Ladies' Blouses, Etc.



CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

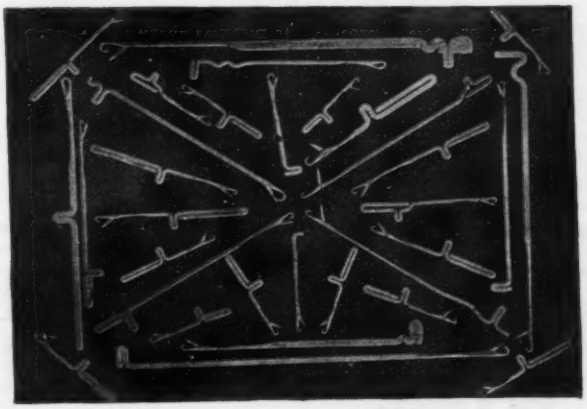
The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.



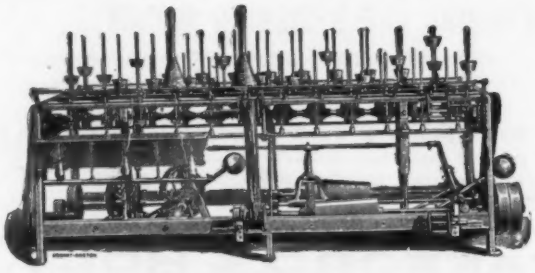
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

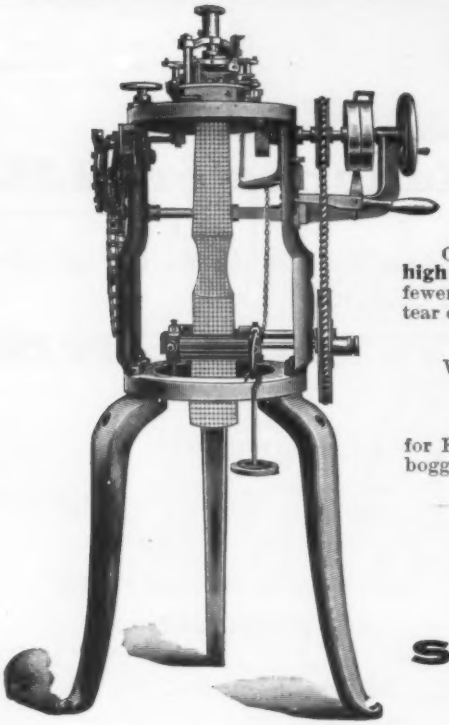
A RARE OPPORTUNITY TO BUY.

50 New Victors, various sizes.
28 Beattie & Hepworth loopers.
1 Corneley embroidery machine.
10 Hosiery presses (lever).
1 Hydraulic 12-plate press.
3 Hemphill machines, 3¾ inch, 160 needles.
150 Ribbed underwear machines, various sizes and makes.
1 Speed lathe. 1 Sensitive drill.
60 Brinton & Co. ¾ aut. knitters, sizes.
27 Standard A machines.
56 Union Special machines, various styles.
1 Singeing machine.
2 No. 50 Merrow machines.
15 Mayo machines.
100 Brooks welters.
4 Jones' fleecing machines.
98 Brinton & Co. and other make hosiery ribbers.
36 Invincible machines, 176 needles, almost new.
1 Wayburn fabric cutter.
40 Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 24 spindle Payne Skein winder
50 National spring needle machines.
1 Sandusky mangle, 60-inch.
1 26-inch belt driven extractor.
4 Old style Jackson winders.
2 Lindsay & Hyde winders.
2 No. 35 Merrow small shell machines.
1 Industrial over-seamer.
2 Typewriters.
2 Cyclone hosiery dryers.
5 Band folding and cutting machines.
1 48 spindle Payne Cop winder.
1 Hemphill Rib-cutter.
15 Standard B. machines, 200 needles.

WRITE FOR COMPLETE LIST.

APPRAISEMENTS A SPECIALTY.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

LITTLE FALLS, N. Y.

"The best is cheapest."

The Knitting Machines Made by

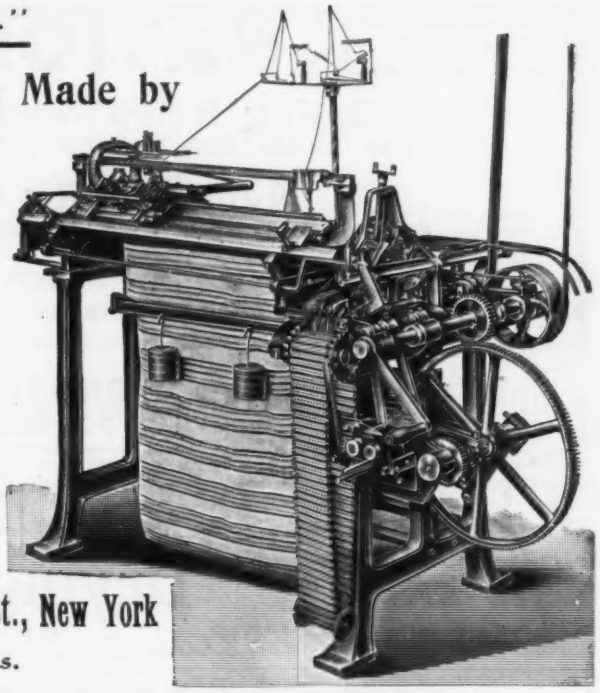
WILHELM BACH,

Apolda, Germany

are made of the highest grade tool steel, best constructed, and more durable than any other machines on the market for

Knitting Fancy Vests, Sweaters, Golf Jackets, etc.

Fully Automatic Power Machines a Specialty.



D. Rheinauer & Co., 136 Greene St., New York

American Selling Agents.

CHARLES COOPER,

BENNINGTON, VERMONT.

MANUFACTURER OF

Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder. **Spring Needle Cylinder Rib-Top Machines**, for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

COLLARETTE ATTACHMENT

EUROPEAN OFFICE:

15 Newarke Street, Leicester, England.

C. J. SIBBALD, General Representative, 757 River St., Troy, N. Y.

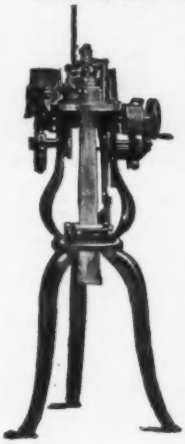
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

SMALL RIB MACHINES
CROCHET MACHINES

NATIONAL

SHELL STITCH
MACHINES

Spring Beard Needle Machine
For SEAMLESS HOSIERY, Plain and Novelties

Automatic Rib Machine
For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion, Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

NATIONAL AUTOMATIC KNITTER CO.
SEND FOR FULL PARTICULARS
724-726-728 Cherry St., Philadelphia

WILLIAM C. BULL, BENNINGTON, VERMONT.

MAKER OF

For Ladies', Gents', and Children's Goods.
LATEST STYLES.
BEST WORKMANSHIP.

Drying Form Boards
OF EVERY VARIETY.

WOLFGANG RICHTER,
Importer and Builder of

Full Fashioned Knitting Machinery

N. E. Corner Third and Green Streets,
PHILADELPHIA, PA.

Perfect Fast Black for Hosiery That Will Not Tender the Goods

Manufactured by A. N. DUBOIS, Inventor and Patentee. Works: N. W. Front St. and Lehigh Ave.
Private Office: 2170 Sedgely Avenue, Philadelphia, Pa.

I offer the trade the following specialties that I manufacture exclusively for the FAST BLACK DYERS UPON COTTON HOSIERY:

FIRST:—My **Latest Improved Sanitary Fast Black in Liquid Form** ready for instant use. This Black is so compounded that it will stand the highest degree of heat of the Summer without in the least tendering the goods after they have been given the lisleing finish and let off in the ageing room. This black will oxidize and lisle quickly and permit the filling of the oxidizing rooms three times in 24 hours on the lisle finish when room is of good size, and not less than two times in 18 to 20 hours in boxed-in machine.

SECOND:—My **New Compound Liquid Trichromate,** far better than the Bichromate now used by all fast black dyers. With this new product the fast black dyers can make their black ungreenable if they so desire, because it is much richer in chromium and oxygen than the Bichromate, as can be seen by their chemical formulæ, which is for the Bichromate Cr_2O_7 and for the Trichromate Cr_3O_{10}, or one more chromium and three oxygen, which make it one-third stronger than the Bichromate. This oxygen acting upon the green oxidized aniline, makes it ungreenable, which can not be done with the Bichromate. But most important is the fact that no steam is required, as it acts well with cold water, which saves coal and makes the dye house comfortable.

THIRD:—My **Compound Fast Black Fastener and Brightener,** to be used either with the Trichromate or the ordinary Bichromate, also in the cold, and which will give a lustre to the goods never before obtained by Bichromate. It is put in the chrome bath, and its action is such that the goods get ungreenable and lustry; indeed, the lustre is such that Egyptian yarn knitted hosiery looks almost as bright as though mercerized yarn was used. Fast Black Dyers will find it an invaluable chemical with which they can produce either shade of black they desire and give their customers a black that will not turn green to acid muriatic test.

FOURTH:—My **Diamond Softener,** already put up for instant use. This softener is better than any soap or olive oil softener made or any other similar compounds. It is the result of my 24 years' experience in fast black dyeing. It never will stain the boxes or bands of hosiery, it has a pleasant odor and gives a nice finish. It agrees well with any colors as well as fast black.

With the above four compounds the proprietors of fast black dye works or hosiery doing their own dyeing are sure to get good results always, and will not depend upon unskillful boss fast black dyers. The boss dyer will find it very convenient to have his dye and finishing compounds already made up for instant use.

In offering the trade my Latest Improved Sanitary Fast Black Dye in Liquid Form, I mean to allow the use of my Letters Patent, No. 723,147 for the Lisle Thread Finish free of any royalty, and will give also free of charge all instruction necessary for the dyeing and finishing process, and so long as one uses the fast black dye, he will be permitted the use of the Lisle Thread Finish Letter Patent free; this privilege, however, to cease when applied to other fast black dyes.

Besides the above specialties, I retain my former business of starting up mills in fast black and colors dyeing and bleaching, and contracting for complete equipment with or without the dye formula.

PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

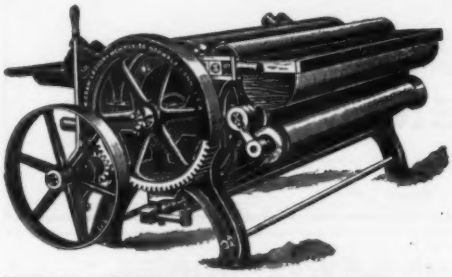
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

J. W. CRAW LAUNDRY MACHINERY CO.,

SOUTH NORWALK, CONN.

HEPWORTH & CO.'S

Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

JOHN W. HEPWORTH & CO.,

N. W. Cor. Lehigh Ave. and Mascher Street,

PHILADELPHIA.

Stanton & Lewis

CENTRAL STEAM FORGE

316 and 318 Florist St.,

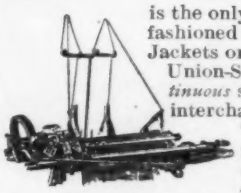
PHILADELPHIA .. .. PENN.

The best equipped shop in the United States for the Manufacture of

Knitting Machine Cylinder

and Sinker Bed Ring Forgings, from the smallest to 30 in. dia. of the best steel.

The Grosser PATENT FLAT KNITTING MACHINE



is the only reliable machine for full-fashioned Sweaters, Cardigan or Golf Jackets or Vests, Gloves, Underwear, Union-Suits, etc., that gives *continuous* satisfaction. All parts are interchangeable on our new style. The only automatic Machine for Jacquard Honey-Comb or Seamless Shaker Sweaters. We have the only first class High Speed 2 thread Lockstitch Overseamer for selvedged Knitgoods, that will sew in Sleeves or hem in double Bottoms on Sweaters without puckering. *ARTHUR MUELLER, 780 Madison St , Brooklyn, N. Y. Telephone 665a Bushwick.*

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

J. BRAY,

Hancock and Oxford Sts., Philada., Pa.

HOSIERY PRINTER.

2-COLOR WORK A SPECIALTY.

Printing Blocks made for the Trade. Best Work.

Special Designs a Feature. Lowest Prices.

LEWIS JONES,

60½ and Media Streets, . . . PHILADELPHIA.

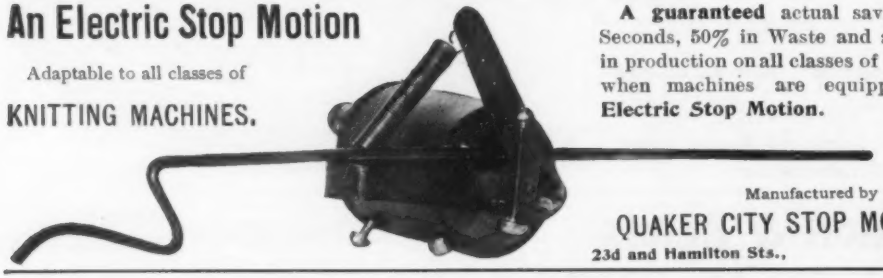
GAS ENGINES for city or country
BRUSHING MACHINERY
KNITTING MACHINERY

EFFICIENT
DURABLE
LOW IN PRICE

An Electric Stop Motion

Adaptable to all classes of

KNITTING MACHINES.



A guaranteed actual saving of 90% in Seconds, 50% in Waste and a 30% increase in production on all classes of Knitted Goods, when machines are equipped with this **Electric Stop Motion.**

Manufactured by

QUAKER CITY STOP MOTION CO.,

23d and Hamilton Sts., Philadelphia, Pa.

Builders of
Steam Presses,
Oxidizers,
Chromers,
Tom Toms,
Pumps,
Extractors.

STEAM PRESSES, HOSIERY FINISHING AND DYE HOUSE MACHINERY.

F. F. Pownall IRON WORKS,

JAMESBURG, N.J.

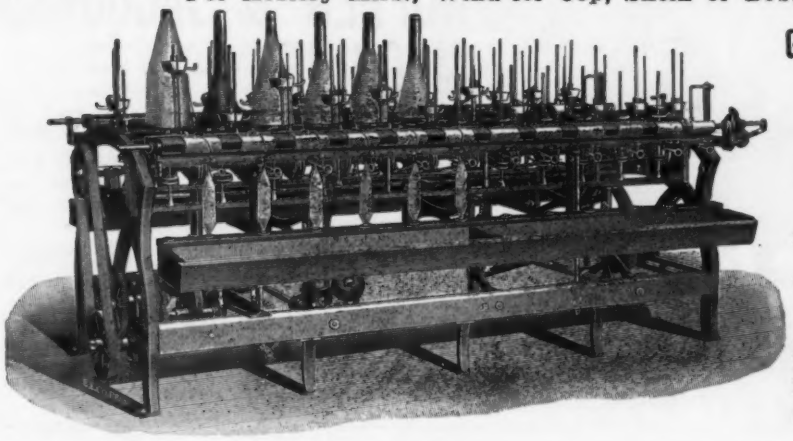
Hosiery and Laundry Dryers.

Complete Dye Plants Erected.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



GEO. W. PAYNE CO.,

[Est. 1865. Inc. 1903.]

Builders of the

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

OFFICE, 102 BROAD STREET
Pawtucket, R. I.

WILLIAM R. DILLMORE, President. JOHN C. EGLY, Secretary and Treasurer.

KEYSTONE FULL AUTOMATIC KNITTER.

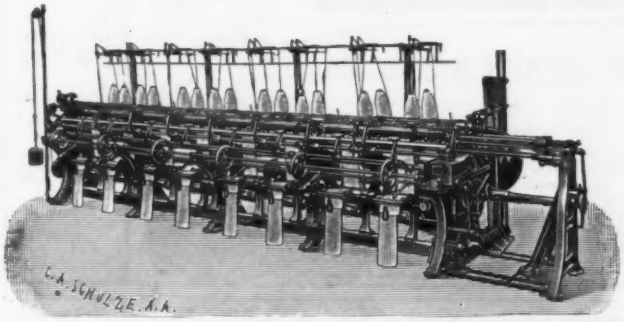
The simplest machine of the kind ever built. A small bench machine running with a 3-4 inch belt. Can be used with two cylinders, or transfer points if desired. Positive thread splice. All parts interchangeable. Call and see it in operation in our offices.

MANUFACTURERS OF LATCH NEEDLES

We can furnish you needles for any make of machine that you use. We number among our customers, the best known mills in this country. We will be pleased to estimate on any line.

KEYSTONE KNITTING MACHINE MFG. CO., 2600 North Sixth St,, Philadelphia, Pa.

SEYFERT & DONNER, CHEMNITZ, GERMANY.



BUILDERS OF ALL KINDS OF

Flat Knitting Machines

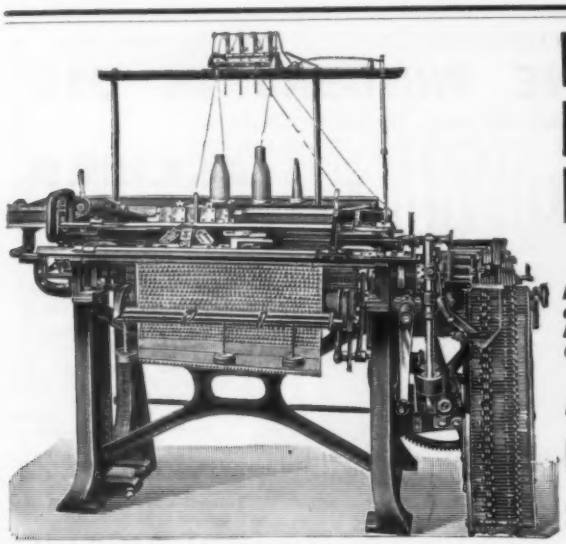
(LATCH NEEDLES)

This cut shows the **AUTOMATIC NARROWING MACHINE**, eight at once, for the manufacture of plain, seamless legs of Ladies' hose in endless bands with dividing thread. These legs, footed on the Circular machine, give the most perfect and cheapest full fashioned seamless hose that ever existed on the market.

N.B.—Narrowing Machines are built in various types for the manufacture of all kinds of underwear, garments, etc

FULL AUTOMATIC POWER KNITTING MACHINES—Independent Heads. Patentees and sole makers of the "**TEUTONIA**," best and quickest hand-knitting machine for hose and half hose. Griswold heel, narrowed toe.

Sole Agent for the United States, JULIUS MULLER, 132 Melrose Street, Brooklyn, N.Y.



Full Automatic NOPPEN & JACQUARD MACHINE

For High-Grade Sweaters, Jerseys, Etc. in latest plain and colored patterns.

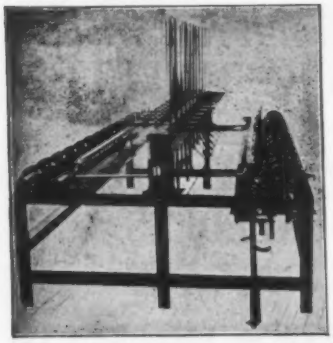
Most durable, simplest construction! Easy to operate and adjust! Recognized as the Best in the market. One operator attends to 3 of these machines! Only reliable machine for above articles.

HIGH SPEED! LARGE PRODUCTION! IN USE EVERYWHERE!

Ask for samples and full particulars. State gauge and size you need.

CLAES & FLENTJE Mühlhausen, Thür, GERMANY.

Representatives: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N.Y., where all kinds of hand and power machines can be seen working.



Germantown Hosiery Machine Works

Lindley's New Automatic Power Glove Fingering Machine, Cardigan Jacket and Circular Knitting Machines for Shirts and Hosiery.

Germantown Skein Winder and Links for Double Ribs

Cylinders and Dials of all kinds made and hardened. Special Machine and Jobbing Work promptly attended to. Also equipped to do general repairing of Platt's Cotton Spinning Machinery. Correspondence solicited.

GEO. W. LINDLEY, Prop. 5120 Wakefield St. GERMANTOWN, PA.

Drying Forms.

BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA.

Hosiery Boards.

WILFRED WELLS,

Sole Manufacturer of the

CHAMPION HOSIERY STAMP.

PATENTED JANUARY 7, 1896.

The Only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics. BLOCKS FOR PRINTING HOSIERY.

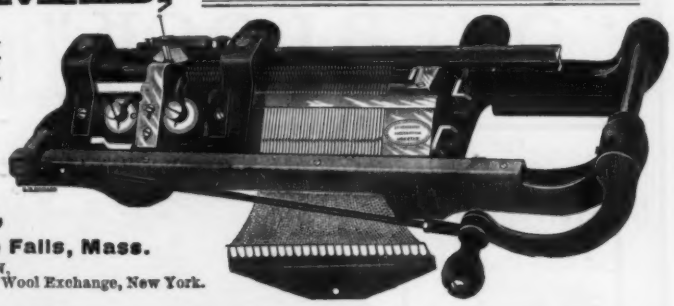
505 W. Lehigh Avenue, . . . PHILADELPHIA, PA.

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.

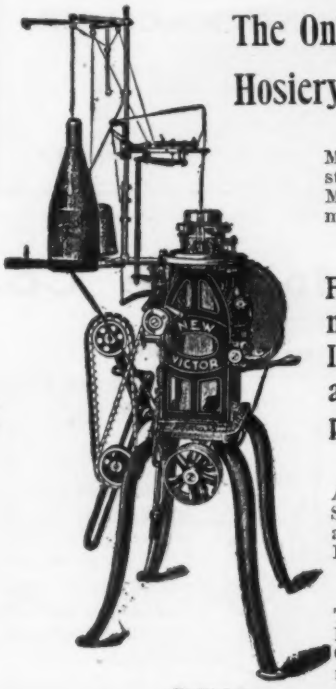


LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 22d St., Chicago.
L. D. SANBORN, Room 503 Wool Exchange, New York.

The "New" Victor



The Only Reliable Hosiery Knitter.

More Simply Constructed than any Machine on the market.

Full Automatic and Interchangeable in all its parts.

A Two-Color Striper, also Lace and Combination Lace and Stripe.

The Best and only Positive Yarn Changer on the market.

Built by

American Knitting Machine Co.

Office and Works:

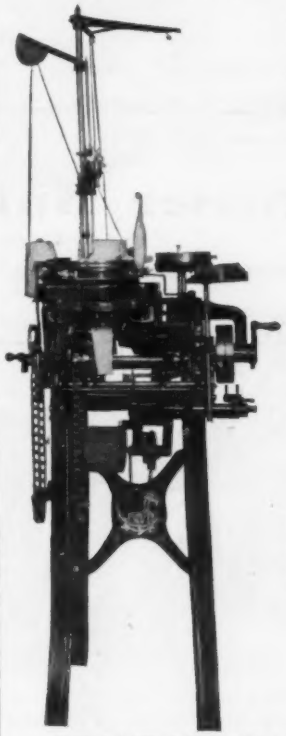
167 Oxford Street, PHILADELPHIA, PA.

Southern Branch: Hendersonville, N. C.
R. M. OATES, Mgr. Southern Branch.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

ARE YOU INTERESTED?

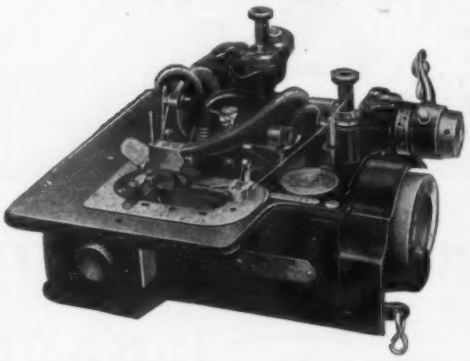
STANDARD MACHINE CO.,
508 Ludlow Street,
Philadelphia.

"OVERLOCK" Machine

TRADE MARK. (Pat. April 5, 1892.)

Patent twice upheld by U. S. Court of Appeals.

For Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION,** and for making "Overlock" Corded Edge on Lace Curtains, Silks, Ribbons Etc.



Extract from Report of U. S. Consul at Nottingham, Eng.

"The Overlock stitching device of Willcox & Gibbs has had a phenominal success since the date of its introduction * * * * The keen competition among manufacturers has necessitated its use; both as a matter of economy and to improve the character of output for a discriminating market."

TRADE MARK.

WILLCOX & GIBBS SEWING MACHINE COMPANY

General Offices, 658 Broadway, cor Bond Street,

NEW YORK, N. Y.

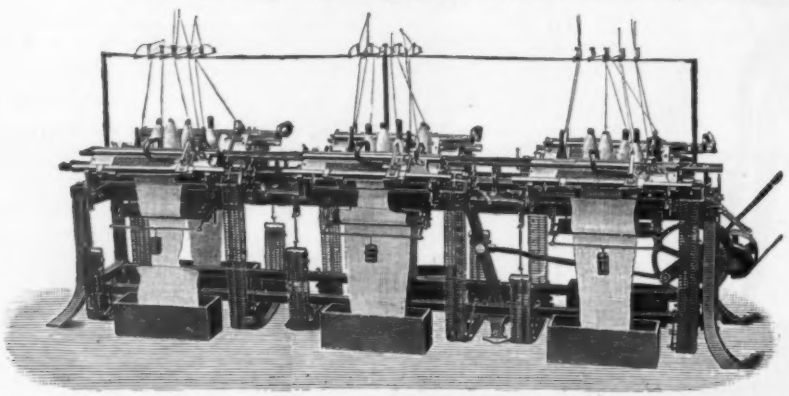
Business Est. 1859.

Branches: LONDON PARIS MILAN DRESDEN

The Grosser Knitting Machine Co.

MAX NYDEGGER, Gen. Manager.

Wool Exchange Building, Room 400, 260 W. Broadway, NEW YORK.



Original Grosser Knitting Machines for all purposes. Hand and power motion.

Full Automatic Fashioning Machines (autom. widening) for every kind of *plain* and *ribbed* goods, seamless sleeves and legs, combinations, pants, suits, etc.

Full Automatic Sweater Machines with independent heads.

Jacquard Nop Pattern Machines, with latest improvements. Most productive. Special constructions for all kinds of knit goods. All parts interchangeable. Large stock of machines, parts, needles, etc. Call for particulars about size, gauge, prices, etc., at

GROSSER KNITTING MACHINE CO.,

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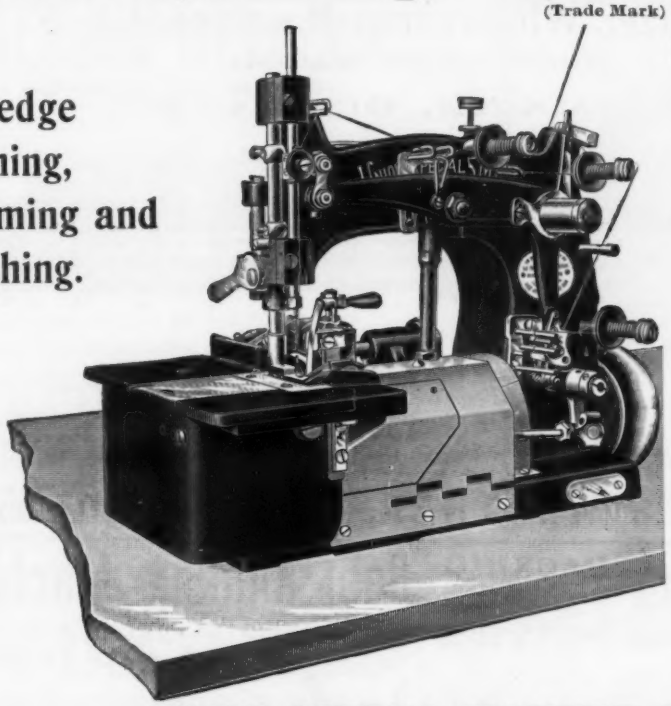
Wool Exchange Bldg, Room 400, 260 W. Broadway, NEW YORK.

High Speed and Most Durable Mechanism are the Essential Elements of Machines to Produce Sewed Articles. We have these Elements in the

New Union Special Single "Interlock" Machine

(Trade Mark)

For Overedge Seaming, Hemming and Finishing.



High Speed Class 15400.

Two or Three Thread Stitch.

Simplicity.

Durability.

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9 Andrews Street, Rochester, N. Y.
96 South Street, Boston.
1230 Olive Street, St. Louis.
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Machinist,

Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

FINE MACHINE WORK.

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We HARDEN all CYLINDERS and DIALS large and small.

Hegeman Seamless Bobbin Cover.

The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

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SOLE AGENT FOR
Adams' Patented Latch Needles

FULL-FASHIONED HOSIERY MACHINERY

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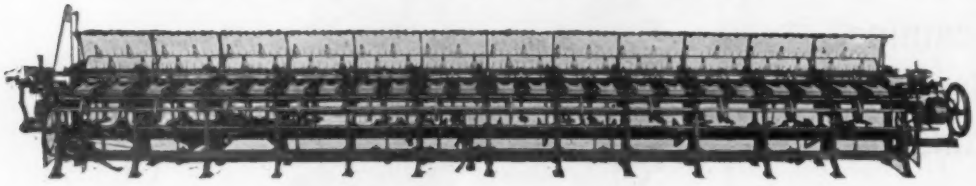
Chemnitzer Wirkwaaren-Maschinenfabrik

(Formerly SCHUBERT & SALZER)

CHEMNITZ, GERMANY.



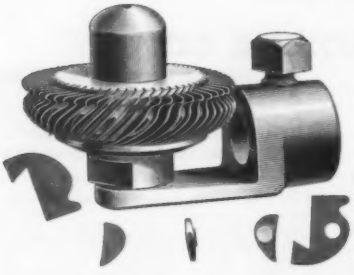
HALF-HOSE LEGGER OF 24 SECTIONS.

All classes of flat work machines for full-fashioned hosiery in all gauges, from 21, 24, 27 up to 51 guage, from 12-24 sections, also machines for full-fashioned shirts and pants in all guages from 6-10 sections, with narrowing and widening.

Representative: OTTO WALTHER, 591 Bourse, PHILADELPHIA

The Tompkins BACKING BURR

Saves Needles



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TOMPKINS BROS. COMPANY

Troy, New York

Best Knitting Machines

IMPROVED CONSTRUCTION

FOR HAND AND POWER DRIVING.

High Speed, Excellent Work-manship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. 80,000 Machines sold.

CLAES & FLENTJE,

Mühlhausen, Thür, Germany.

Agents for the East: Ainslie Knitting Machine Co., Ainslie and Humboldt Sts., Brooklyn, N. Y.
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CRANE MFG. CO. Lakeport, N. H.

Spring Needle Circular

KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets.

NICETOWN MFG. CO.,

4303-09 No. 18th Street, Philadelphia.

MILL SOAPS

OF EVERY DESCRIPTION. ALSO LAUNDRY SOAPS.
ALL GOODS GUARANTEED.

WM. COREY CO.,
Manufacturers of Knitting Machine
Latch Needles,
MANCHESTER, N. H.

EXCELSIOR NEEDLES.
The best Hosiery Needles in the market.
Manufactured by
WARDWELL NEEDLE CO., Lakeport, N. H.

W.M. BREEDON'S SON,
MANUFACTURERS OF
Spring Knitting Needles
AND BURR BLADES OF ALL KINDS.
AMSTERDAM, - N. Y.

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MANUFACTURER OF
Screw Riveted Balmoral and Double Rib
NEEDLES
(Patented May 6, 1890.)
All Work Guaranteed. MANCHESTER GREEN, CONN.

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Manufacturers of all kinds of
SPRING KNITTING NEEDLES
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MANUFACTURERS OF
LATCH NEEDLES
of all kinds. Warranted in every respect.
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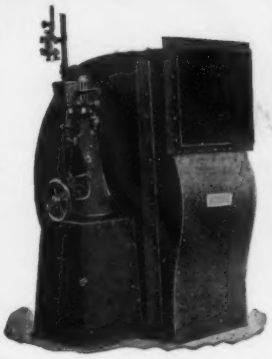
Manufacturers' Supplies Co.
418 ARCH STREET, PHILA.
Needles and Supplies for Knitting Mills.
Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

EDWIN A. NEWTON,
KNITTING MILL MACHINERY AND SUPPLIES,
NEW AND SECOND HAND.
Exclusive Agent for the Hemphill Full Automatic Knitters.
245 Race St., Philadelphia, Pa.
Expert Appraisals on Machinery.

THE DAVIDSON FAN
MECHANICAL HEATING, VENTILATING AND DRYING, MECHANICAL DRAFT FANS



MASSACHUSETTS FAN COMPANY, WALTHAM, MASS.

Hosiery Man Wanted

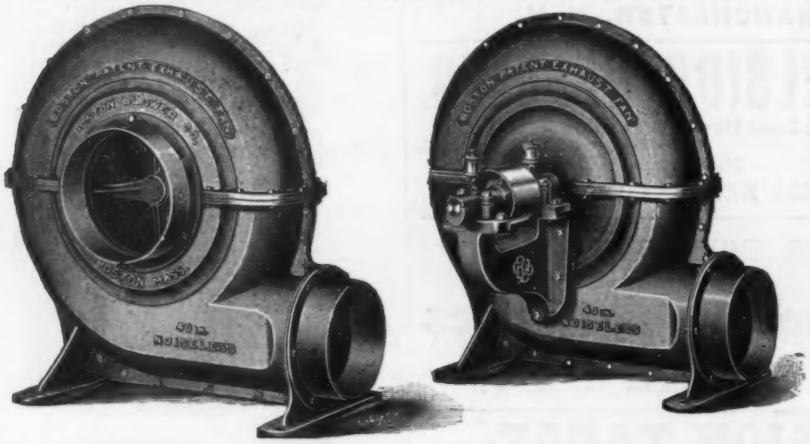
Owners of hosiery mills in the South want to secure practical hosiery man to take charge of the plant, who will invest about $6,000.

For further particulars refer to file 9112 and address,

M. V. RICHARDS,
Land and Industrial Agent, Southern Railway,
WASHINGTON, D. C.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**

Reels for Cotton WOOLEN AND WORSTED

Patented Hosiery Winders, Cop Winders and Spoolers.

LINDSAY, HYDE & CO.,

2124 to 2130 East York St., PHILADELPHIA, PA.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

Water Wheel Governors

For TEXTILE MILLS

We Guarantee Satisfaction.

Replogle Governor Works

Write for Catalogue T. AKRON, OHIO.

CELEBRATED BRAND PYRAMID LACINGS

For Underwear, Overshirts and Sweaters,

JOHN CATHCART & CO.,

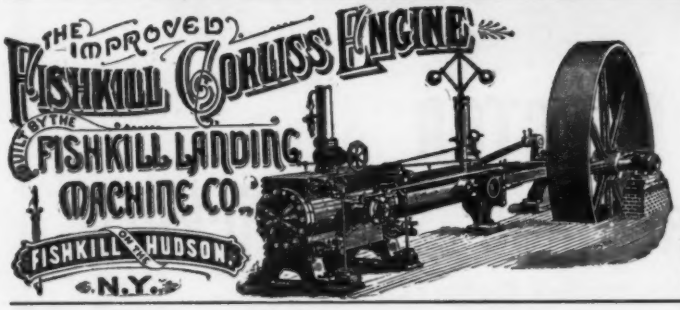
115 Franklin Street, NEW YORK.

SAMSON TURBINE

An EVEN and REGULAR SPEED under all CHANGES of LOAD makes the SAMSON especially desirable for driving all classes of machinery where the output must be UNIFORM in TEXTURE and QUALITY.

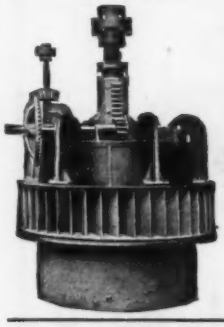
Write Department A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.



Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.



Risdon-Alcott Turbine Co.

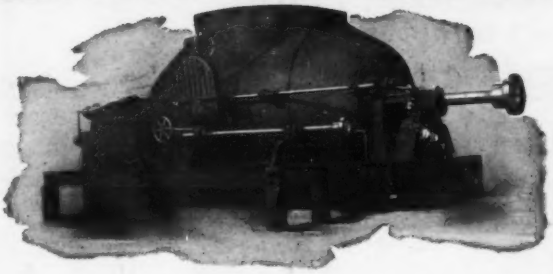
MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

PAIR McCORMICK TURBINES

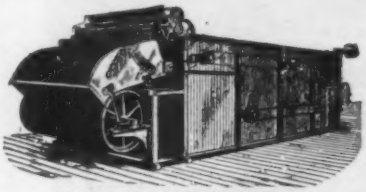


4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.
YORK, PA.
Boston Office, 176 Federal Street.

SEP 14 1904

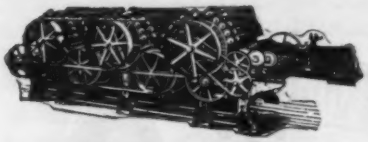


Automatic Cotton Stock Dryer.

Automatic Yarn Dryer.

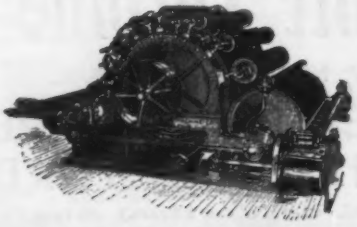
"CYCLONE" DRYERS

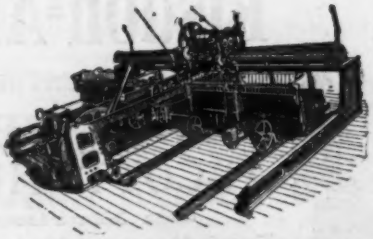
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

Talks to Textile Manufacturers

CHAPTER VII

Muslin Manufacturers

will find on pages 91-92 of this issue an article that will set them thinking.

After they have thought and are ready to act

I HAVE FIGURES

that will prove convincingly that muslins can be advertised in a way that will end in *greatly increased business and much larger profits.*

THOMAS BALMER, Advertising Manager

The Butterick Trio

THE DELINEATOR—THE DESIGNER—NEW IDEA WOMAN'S MAGAZINE

Butterick Building, NEW YORK

JAMES SMITH WOOLEN MACHINERY CO.

411 to 421 Race Street, Philadelphia.

Woolen Machinery

FOR

Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.

Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 59.

Buffalo Fan System

OF HEATING, VENTILATING, DRYING AND HUMIDITY CONTROL.

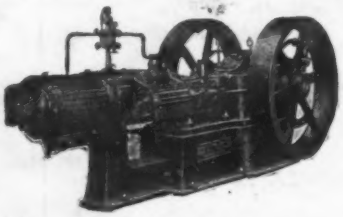
Used by America's Foremost Textile Mills.

Economical - Efficient - Reliable.

Buffalo Engines

FOR ELECTRIC LIGHT AND POWER SERVICE.

High Speed



High Grade

Buffalo Forge Co., Buffalo, N.Y.

NEW FOSTER CONE.

Open wind from start to finish of Cone.

No press-offs from knots, over-winds, etc.

The only perfect system of winding yarn for knitting purposes.

Over 30,000 spindles in use in the U. S.

FOSTER MACHINE CO.,
Westfield, Mass.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:

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New York Office: Park Row Building.

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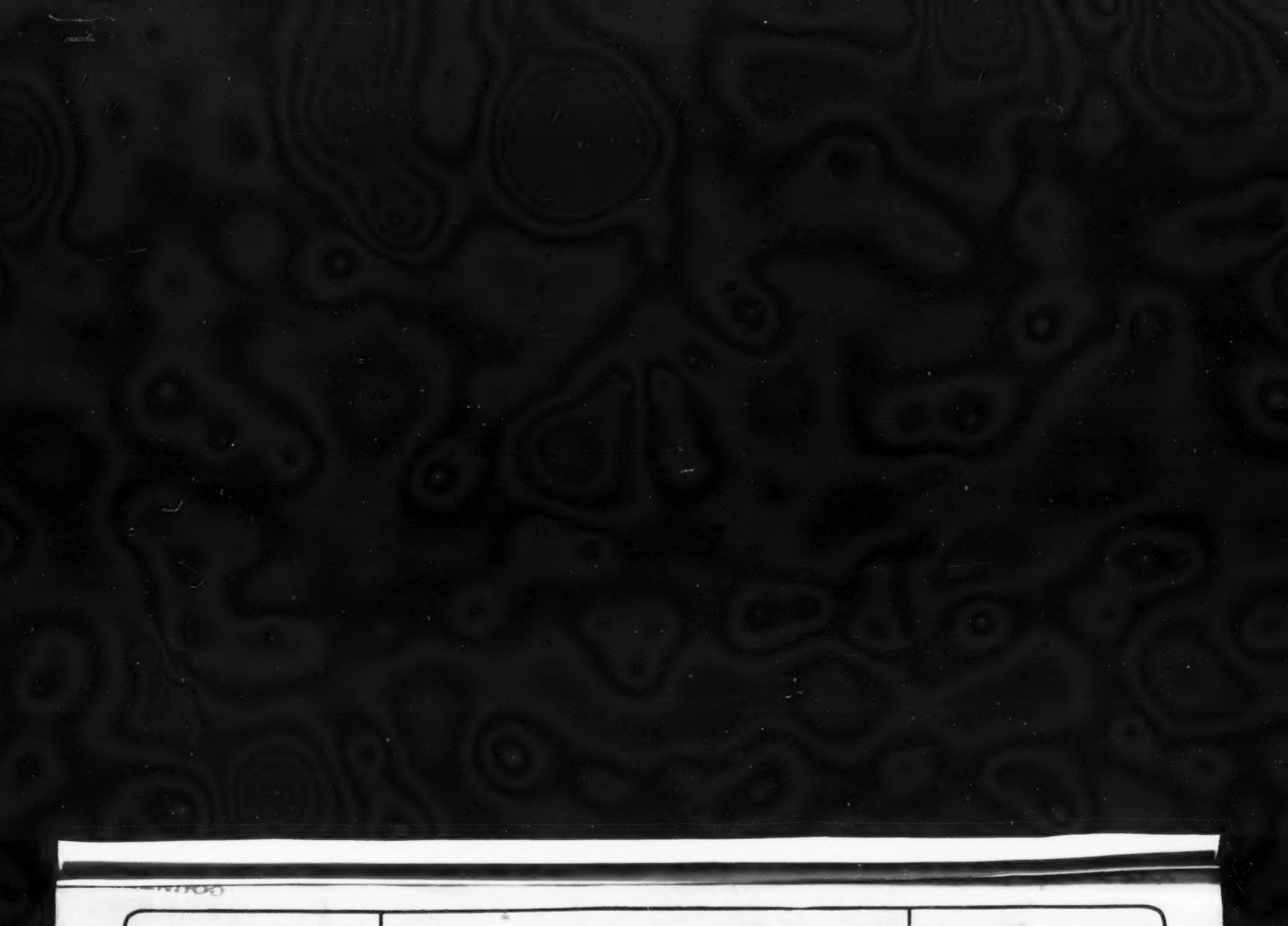
G. P. O., Jan., '05.